COAL AGE

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Devoted to the Operating, Technical and Business Problems of the Coal Mining Industry

JOHN M. CARMODY
Editor

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MASS PRODUCTION

AMERICAN enterprise and engineering skill have carried mass production so far that large-scale operation has been accepted as the ready answer to the wonder of our industrial activity. Skeptical economists and inquiring students of business trends, however, are beginning to ask whether mass production has not been overdone. There is no doubt expressed as to the efficacy of the practice as a means to an end; the question which now disturbs is whether the means has not been made the end itself by many swept along on the current of popular interpretation of engineering principles.

AS A means to an end mass production has been a logical development. It is the successor in interest of the social movement which first lifted the practice of the simpler industrial arts from the home to the village workshop and then merged the communtiy factory into the larger establishment. It follows naturally the era of combination and trustification since that era ended on a note of dissent that the idea that mere bigness alone assured success. Business discovered—sometimes to its financial sorrow—that wasteful operation was as incompatible with profit in the industrial giant of the beginning of the century as it was in the pygmies of the '80s.

SPURRED on by the examples of outstanding successes where scientific management, using mass production principles, reduced unit costs, widened markets, increased consumption and returned greater profits, the zeal for large-scale output has led many business men to indulge in an orgy of production productive of nothing but profitless prosperity. So now we are discovering that steady reduction in unit costs without synchronization of production with profitable distribution is as ineffective as mere bigness in guaranteeing financial stability to industry and satisfactory earnings to the partners in industry.

NO INDUSTRY, perhaps, stands in greater need of a fresh examination of the place mass production holds in successful operation than the coal industry. Coal producers have succumbed to the tonnage delusion—forgetting that the opportunities for a rapid increase in consumption which are open to some industries by reductions in costs are denied to coal. The demand for coal will grow certainly with the expansion of industrial activity, but the rate of growth is on a declining curve. Mass production in the coal industry, therefore, is to be encouraged only when it involves reasonable guarantees of profit.

THE hum of industry when it is singing of profitable dollars is a cheerful sound. When it becomes a rattle which shakes the financial stability of the organization furnishing the driving power, silence would be preferable—safer and more profitable. Mass production which drags down total net earnings to the vanishing point is an economic fallacy.

An Artistic Impression of Southern Illinois

Courtesy H. H. Taylor

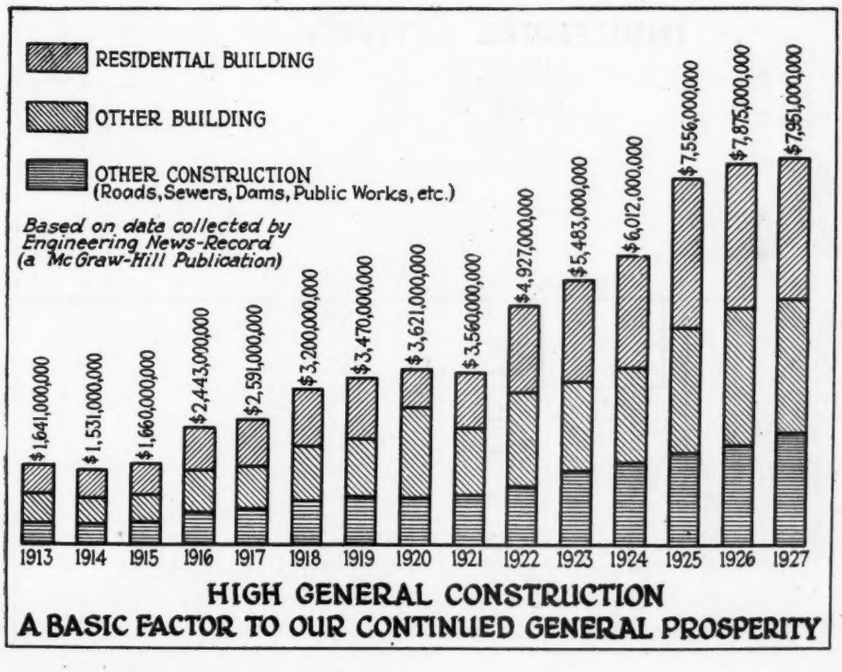
CONTINUED PROSPERITY *Indicated by* Basic Economic Factors

By Robert M. Davis
Statistical Editor
McGraw-Hill Publishing Company

THERE are two types of economic developments which determine the relative business and industrial conditions of our nation. First are those developments which are like the waves on the seashore—advancing and receding, more or less temporary or changing in nature—and second, developments which are like the mighty tides of the ocean—steadily rising and advancing, overpowering in their influence on general national conditions.

Consider first the temporary economic factors upon the horizon as the year 1928 opens. On the favorable side there are: (1) No inflation of prices. The Irving Fisher commodity price index on Jan. 1, 1928, was practically on the same level as at the opening of 1927. (2) Labor is well employed. The real purchasing power of the American wage earner today is 35 per cent over that of pre-war times. (3) There are no surface indications of overbuying. So-called hand-to-mouth buying, which has prevailed, is a safeguard against swollen inventories and overproduction. (4) There are no signs of a credit stringency. (5) Not only has the purchasing power of the American wage earner been maintained on a high plane but that of the American farmer has been increased by about 11 per cent during the past year. (6) General construction during 1928 should be in line with the trend of 1927. There is no reason to believe that there will be any material falling off in the volume of new construction. (7) Automobile production should be of record proportions during 1928 with Henry Ford back in the picture. (8) A federal tax reduction of a quarter of a billion dollars, which will benefit most largely the small manufacturing corporation. (9) European conditions, political and economic, while far from settled, are improving steadily. The nations of Europe are studying industrial economics as never before, and the people are working more steadily, thereby increasing their purchasing power and creating new markets for American products.

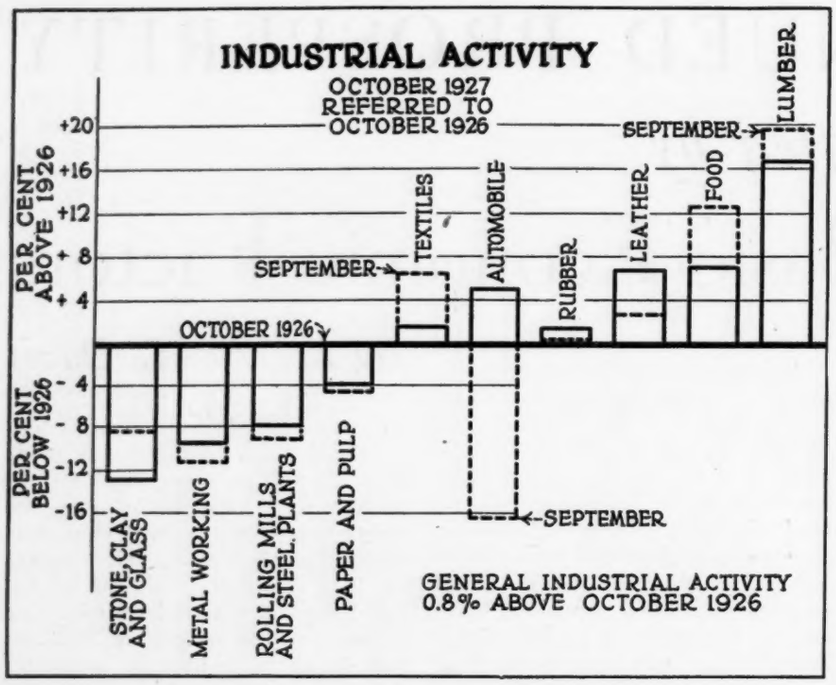
On the unfavorable side we must place first relatively unsatisfactory earnings by manufacturing corporations during the second half of 1927. We have had record production and distribution of manufactured products, but the price per unit of commodity sold, especially during the summer months of last year, was materially under 1926. The opening of 1928, however, finds the wholesale price index on a level with that reported at the opening of 1927, so that even here we have an apparently favorable economic factor. Secondly, this is a political year, making possible almost any political hazard. Third, the reparations question looms large this year. Germany's payments reach their maximum next September. To make these payments probably will call for increased economy in German public expenditures, and financial pressure most likely will result from high bank rates, and these conditions probably will react unfavorably on American conditions toward the end of 1928.



In addition to these more or less changing economic factors there have developed in this country, largely since the war period, basic factors of a long-time nature—largely American in character. These are the influences which presage a continuance of our general prosperous condition for some time to come.

It wasn't so very long ago that we believed most implicitly in the slogan "as goes the iron and steel industry, so goes the nation." To a large extent this belief still prevails, but the products of other primary industries have become during the past few years so interwoven into the very social fabric of the American nation that the operations of those other industries now exert a big influence on the general industrial situation.

The very favorable economic condition resulting from this new set-up of industrial influence was well brought out during the fall months of last year. In August seven of the nation's primary industrial groups were operating at a rate considerably below that reported for August, 1926.



Rolling mills and steel plants recorded activity about 2 per cent less and the activities of the ferrous and non-ferrous metal working plants were about 7 per cent under 1926. On the other hand, three just as basic industrial groups—lumber, textiles and rubber—reported activities materially over August, 1926. As a result, when these industrial groups are weighed in accordance with their importance in the general industrial structure of the nation, the rate of production in industry as a whole was only 0.3 per cent less instead of around 5 per cent under 1926 as would be indicated by operations in the iron, steel and metal industries.

Again in September we find the industrial balance still maintained, despite decreased activities in rolling mills, steel plants, and the metal-working and automobile plants. In October the various groups were operating at rates closer to 1926—some above, some below, but still maintaining a balance in general industrial operations. The same was true in November and December.

These conditions make clear that the overwhelming influence of iron and steel industrial operations has been largely dissipated by the rising influence of these other industrial groups. Now, what has been the cause of this new alignment of American industry? The underlying reasons are five-fold: (1) Increased use of power per worker; (2) the receptivity of the American public to new commodities; (3) modernized distribution technique; (4) increased purchasing power of the American public; (5) industrial research.

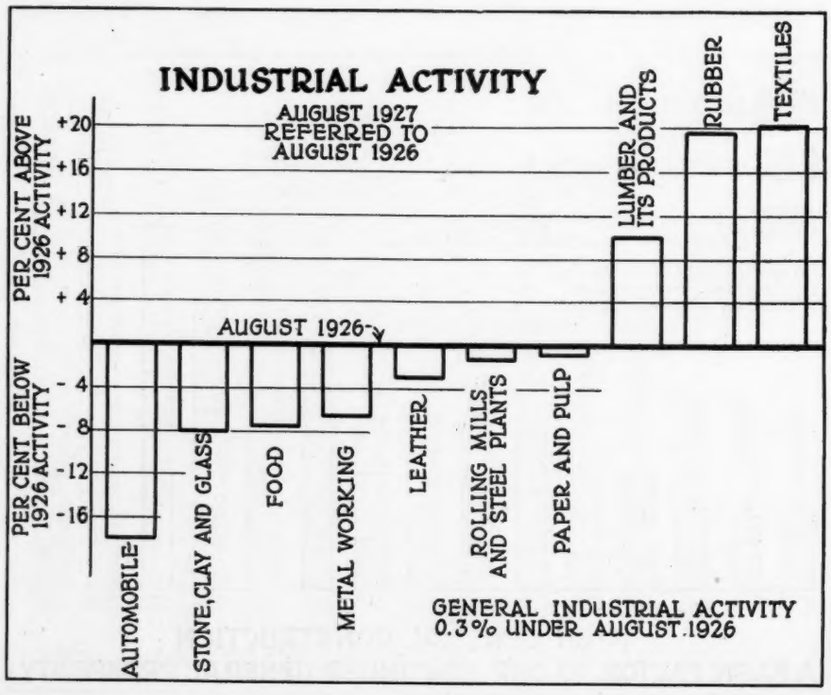
During the past 28 years we have transferred the work of industry from the backs of men to the inanimate forces of steam and electricity. Blast furnaces have installed 47.3 hp. per worker, an increase in the use of mechanical power per worker of 273 per cent since 1899. The food industry now has 6.9 hp. installed per laborer, an increase of 263 per cent since 1901. Industry as a whole has 4.3 hp. installed per wage earner, or just double the average in 1899.

As a result of this greatly increased use of power and machinery 67 men now do as much work as 100 men did before. That is, out of every 100 men employed in general industry in 1899, a surplus of 33 men has developed through the increased use of power and machinery.

Yet we have not had an ever-increasing army of unemployed in the nation. The surplus labor has gone into new industries, making products undreamed of in 1899. Products which are recognized as absolutely essential to our modern social life were unknown to the parents of most of us as they entered into their home life — automobiles, radios, vacuum cleaners, talking machines, refrigerators, washing machines, rayon and other products of the chemical laboratory. And yet there is every reason to believe that we are but at the beginning of new developments and adventure. It is in the manufacture of this ever-growing list of new commodities that America has absorbed her surplus labor.

A very significant result of this ever-increasing use of power per worker has been a materially increased production per worker. While the number of workers in manufacturing industry has been growing less and less the volume of products manufactured has been growing greater and greater. During the last five years the production per laborer in industry as a whole has increased by about 20 per cent.

Not only have great strides been



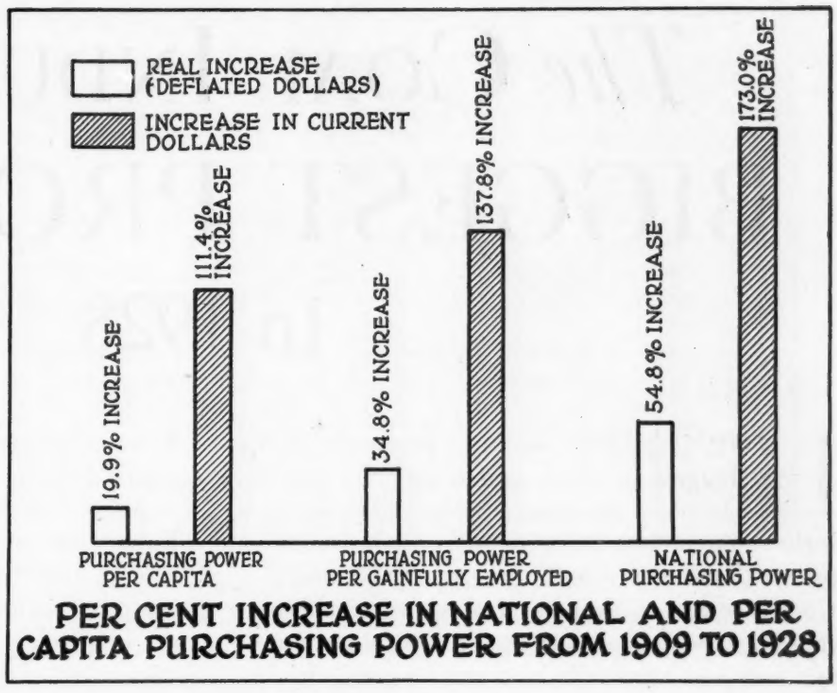
made in the economics of production but the technique of distribution has been entirely modernized through a careful study of the buying habits of the American public and of general industry, the elimination of waste—both material and physical—and rapid and cheapened transportation.

These tendencies in production and distribution, taken in connection with the distribution of technical knowledge through the technical as well as the non-technical press, has educated the American public to a commodity demand which is without comparison in any other nation.

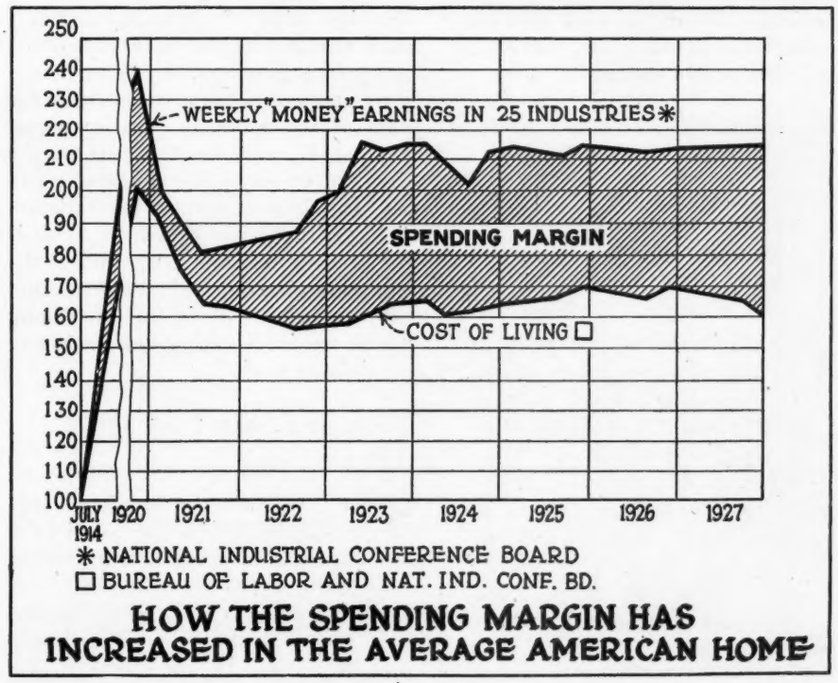
As a result of these economic conditions we find that there has been an ever-increasing spread between the wages received by American labor and the cost of living, leaving a greater and greater margin available for recreation, saving, insurance and the purchase of manufactured products. At the opening of last year the statement was made that the limit of this spread between income and the cost of living had been reached, but 1927 appears to have increased the margin even further.

The present purchasing power of the nation as a whole in deflated dollars or real purchasing power is 55 per cent over that of 1909, and in current dollars is 107 per cent over 1909. The increase in real purchasing power per capita is 20 per cent over 1909, and that of the gainfully employed is 35 per cent over 1909.

Here then is one answer to the present ability of American industry to maintain an average high rate of production while some of the most basic industries are witnessing a semi-depressed condition. The American people have the money to spend, and they are spending large portions of it on products of industries upon which the operations of the iron and steel industry have but little direct influence. In other words, American business has reached that status of well-being where it no longer has to fear a recurrence of the radical spreads from prosperity to depression that formerly afflicted it. Such favorable economic factors as I have just outlined have well been termed "our long-time guarantees of prosperity."



PER CENT INCREASE IN NATIONAL AND PER CAPITA PURCHASING POWER FROM 1909 TO 1928



HOW THE SPENDING MARGIN HAS INCREASED IN THE AVERAGE AMERICAN HOME

Behind this increased production per worker through the greater use of power and machinery, behind these new products which have become so essential to the average American's well being, lies the research laboratory, where engineering theories are evolved and brought to practical application, and where more efficient methods and radically new products and processes are discovered. It is here that we really find the mainspring of our long-time guarantee of prosperity.

As to the influence of the presidential election it is true we have had some rather mean presidential years, but study of the economic background of these years will reveal that in such election years the political parties usually have inserted planks in their platforms that have involved vital economic questions, questions such as the elimination of the gold standard, protection or free trade, sectional differences, foreign relations. In the coming election it is probable that the economic questions upon which the great political parties will be divided will be of far less importance than usually is the case. Under these conditions we may forget the political campaign as an adverse factor in 1928 business and industry.

We have then a predominance of economic factors favorable to a continuance of our national prosperity during the year 1928.

The COAL INDUSTRY'S BIGGEST PROBLEM In 1928

HOW TO END profitless prosperity is the biggest problem confronting the coal industry of the United States this year. This is the opinion voiced by a majority of the coal company executives responding to an invitation from *Coal Age* for an expression of views on the outstanding problems of 1928. Better distribution methods and a closer balancing of supply with demand are urged as steps in the solution of this problem. Consolidation finds favor with many.

The executive vice-president of one of the largest producing organizations in the bituminous field suggests a general conference of producers and important utility and industrial consumers of fuel for a heart-to-heart discussion of the situation. District selling agencies to handle the output of entire districts are advocated by some.

More scientific management is not neglected. Labor, too, comes in for its share of comment although labor is featured less than might be expected. Freight rates also are attacked by some of the producing interests. The school which believes that the jungle law of the survival of the fittest is the only way out has its spokesmen.

Anthracite executives joining in the symposium stress heavily the necessity for taking such steps as will enable the hard-coal industry to recover markets and prestige lost during the past decade. As one president phrases it, there must be a new state of mind.

Seek End to Profitless Production

Relies on Economic Law To Solve Problem

"THE biggest problem is overproduction," says *S. Pemberton Hutchinson,* president, Westmoreland Coal Co., "and it can be solved only by the law of supply and demand. This will be painful to many coal-mine owners and investors in coal-mining securities, but there is no other economic solution that I can see."

To Sell More Hard Coal: Better Servicing

FROM the viewpoint of the anthracite industry it is the general consensus that the greatest problem is how to sell more coal, states *Samuel D. Warriner,* chairman, Anthracite Operators' Conference. "Our conviction is that the way to sell more coal is to expand and intensify our efforts to make anthracite the best serviced fuel in the world.

"The anthracite industry has concentrated its efforts for years upon engineering problems, reducing costs, improving preparation, lessening degradation, etc. It is only in recent years that it has turned its attention to the problems of merchandising, and personally I have no doubt that it will solve these problems as successfully as it has solved others.

"It is not enough, in my opinion, to 'sell more coal.' It seems to me that along with sales must go the effort to see that anthracite is properly used in the right kind of apparatus and that such troubles as the user encounters are promptly overcome. This means a tremendous amount of work on the part of the producers and an equal amount of work on the part of the distributors in fitting themselves to see that their customers get satisfaction out of the fuel they buy. This is the best way to meet competition; the best way to retain old customers and get new ones. It is the line along which we are working and expect to continue to work."

Mine and Ship Coal Only After Selling

SOLUTION of the industry's biggest problem is a big job, in the opinion of *G. H. Caperton,* president, New River Coal Co. "The matter, as I see it, can be regulated by the industry in refusing to mine and ship coal unless sold before shipment at a

THE LETTER

THE LETTER ADDRESSED BY COAL AGE TO A SELECTED GROUP OF COAL COMPANY EXECUTIVES READ AS FOLLOWS:

"What is the biggest problem the coal industry must face in 1928 and how can this problem best be solved? We would like a brief expression of your views on this question for incorporation in a symposium to appear in the January issue of Coal Age. That issue will be our Seventeenth Annual Review and Forecast Number."

price that would carry a profit to the operation mining and shipping coal.

"It is a predetermined fact that the industry cannot continue along the lines that have been in force for the past several months without financial destruction.

"Some measure should be inaugurated that would permit the exportation of coal from this country. To inaugurate this measure it would be necessary to have a lower export freight rate and a line of boats to transport this coal to South America and the West Indies. I am inclined to believe, however, that the most grievous trouble that the business is suffering from is the shipping of coal without orders at a paying price."

Improved Merchandising Seen As Chief Need

"IN OUR OPINION," declares *Ford S. McConnell,* vice-president, Enos Coal Mining Co., "the greatest necessity of the coal industry for 1928 is:

"(1) Education of its membership in a proper determination of its production and sales costs and a realization that labor cost and supply cost added together do not make a completed cost. A proper calculation and knowledge of all costs is vitally necessary to the industry.

"(2) A fixed determination on the part of the capital engaged in the coal industry to render every possible service to the buying public, and an equally fixed determination to demand from this public a fair return for the service rendered."

Should Make Start in 1928 To Stabilize Output

"LACK of stability, caused by overproduction, is what troubles the coal industry mostly right now," declares *Calvin Holmes,* president, Holmes-Darst Coal Co. "That cannot be cured in 1928. We can make a start, but it will take time to cure the trouble.

"I cannot conceive of legislation which will be helpful. Truth to tell the most helpful thing possible would be to 'unsell' the people on the thought that the industry is grasping, unfair, muddled. So much anti-coal propaganda has been broadcast that we are going through what the railways went through years ago. They got straight with the public; we have the same road to travel.

"Our own government is harmful to us. Every week figures as tonnage, distribution, overproduction — stocks on hand—and prices go out to the desks of all purchasing agents. There is an association of Purchasing Agents and they use these figures—for which I do not blame them at all —to their own advantage. The disorganized coal industry has no weapon to fight with, and the result is that prices today are far below production costs, speaking broadly.

"The country is in no danger from a coal shortage since the power of the unions has been broken. My plea would be to give the industry time to fight its own way to salvation—some of which will come through the bankruptcy courts for many units."

Suggests Joint Conference of Industries To Formulate Buying Code

"AT THIS moment, to my mind, the outstanding problem of the coal industry as a whole," says *G. J. Anderson,* executive vice-president, Consolidation Coal Co., "is how to secure from a nation, vitally dependent upon its service, the hire of which this basic laborer is worthy. When I use 'hire' in this sense, I refer, of course, not to the theoretical profits needed to fulfill the requirements of its combined balance sheet, whose values have temporarily been so disturbed, but to a revenue fitted to the needs of its total income statement.

Photo by Blank-Stoller, Inc.

G. J. Anderson

"What is the present relation between income and outgo?

"The income, partly by natural economic forces and partly by market strategy, has fallen to the approximate levels in 1916. From this wholly inadequate revenue the industry will have to pay its 1928 expenses. The machinery and supplies used in daily operation; the management of many kinds, both that for technical direction and that common to other and more prosperous trades; the capital borrowed in the open market; the essential reserves for depreciation and depletion to safeguard the future; the ever-mounting taxes levied by the community; not to mention the numerous items, minor in detail but serious in the aggregate, such as rents, insurance, travel, communication, and the like—all these are based upon present costs, not upon those of twelve years ago.

"As for labor, wage scales range from the level of a decade ago up to the peak of a post-war boom. Granted that extremes will be absorbed into the national economics of which mine labor is a part, certainly no individual buyer of coal can justly expect this stabilization on the basis of 1916. Yet that is where the collective purchaser is now tending to confine the revenue with which the coal industry must carry on.

"Under these conditions the country is, therefore, securing its essential coal supply at a deficit which may be conservatively estimated at a quarter billion dollars annually. This is tantamount to an extra-legal tax wrested from the labor and capital of a basic industry. In all the states affected it means a lowered purchasing power, economically, and a lowered standard of well-being, socially, before which American industry and the public at large cannot stand unconcerned.

"It may be objected, either by the purchaser of coal or by the orthodox economist, that I am stressing a result and not a cause; that the real evil is overproduction; that the producer has no one to blame but himself; that the buyer is only availing himself of a price level which is the inevitable outcome of supply and demand.

"I shall certainly not deny the excess capacity of the coal industry or

attempt to minimize any natural effects. I shall not even refer to other industries which are similarly equipped but which do not show the same ravages of disease. But the present situation in coal reflects far graver consequences than those of supply and demand.

"Coal is a commodity which, generally speaking, can be produced only *after* it is sold. How shall we determine the proper national ratio of current supply to prompt reserve? The coal industry, by actual demonstration, must stand prepared within a calendar year nearly to double its rate of output. How shall 'normal' demand be fixed as between varying industrial years? A great portion of coal was removed from the markets entirely for months during the recent strike. Why should a decrease in supply result in lowered prices? Ten years ago a government agency—acting in the interest of the public and certainly not partial to the coal industry—after an analysis of production costs lower in nearly all particulars than those prevailing today, fixed coal prices on far higher levels than those of several years past. The theory of supply and demand cannot change the obstinate fact of income and outgo.

"By common necessity, the producers of coal have greatly restricted the number of mines. By continued underemployment, a surplus army of laborers have already been forced from the industrial ranks. By sheer struggle for survival, most expenditures have been reduced to a minimum. Yet each succeeding year sees the revenue for the same, and often superior, service reduced in even greater degree. The inference seems clear that this phase of the problem has ceased to be that of the industry alone.

"In conclusion, I confess, like so many others, to have stated a problem and not to have solved it. Its statement is trite to my fellow producers, its solution will be obscure to the individual buyer. Many of the more far-seeing consumers have watched this trend with concern, have been disturbed by its implications, have attempted single-handed fair play. As a purely practical matter, no speedy or effective relief can be furnished simply and solely by the producer. Public policy has placed the laws across his path in some directions. The intricate structure of freight rates bars a remedy in others.

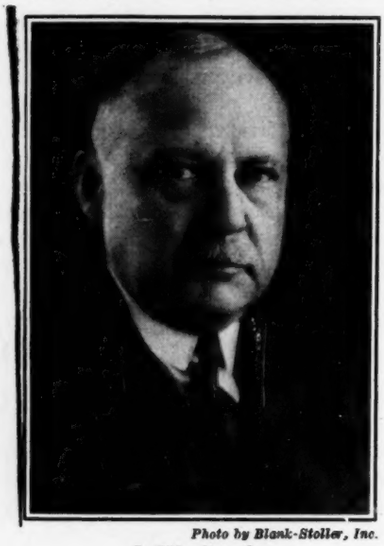


Photo by Blank-Stoller, Inc.

J. W. Searles

Better marketing and co-operation are the most pressing needs of the coal industry in 1928 in the opinion of Mr. Searles, president of the Pennsylvania Coal & Coke Corporation.

Property mergers of a certain type, though eventually helpful and economically sound, are not only immensely difficult but might even, for the moment, intensify his present plight.

"On the other hand, such obstacles need not confuse the purpose or delay the duty of the great coal-consuming groups to aid the restoration of solvency and health to that industry which is so often the very source of their own strength. For the law of supply and demand must always reckon with the law of action and reaction. Methods that now bring woe to the producer, in the past have not left the consumer unscathed, nor will the same forces fail again to turn the wheel.

"Together these two must seek to plan the mutual satisfactions of stability rather than to reap the discontent of alternate feast and famine.

"The first concrete and possible step to this end is a joint conference of those concerned—the coal operator, the railroad man, the public utility interest, the industrial purchasing agent. The delegations should be broad enough to be representative, limited enough to be wieldy. With no time wasted in autopsy, recrimination or individual grief, let them seek a code for coal-buying which will be constructive of inter-industrial service in place of practices which, as at present, are fraught with menace to the stability of future operations."

Sees Most of World's Troubles On Coal's Doorstep

"MOST of the real problems in the business world, I feel, must have been left on the doorstep of the coal man," says *Herbert Taylor,* president, Franklin County Coal Co.

"We have overproduction of the commodity itself, as well as far too many men following the business of digging coal. The great improvement in efficiency of the railroads during the last five years in moving our product in half the time previously taken is a real factor. Also the question of union and non-union districts is most serious to those of us who are immediately affected. A solution of this condition can be found only in a nearer equalization of wages.

"Effective mechanical devices for cheaper preparation bid fair to occupy an important position on the stage of our industry in the near future, but now, as always, geographical location, quality of the coal and mining conditions, added to effective and careful management, with modern, alert business methods in production, service and sales, appeal to me as the real answer.

Better Marketing and Mergers Would Cut Costs

"A CORRECT answer [to the query 'What is the biggest problem the coal industry must face in 1928 and how can this problem best be solved?'] is worth billions," states *Ernest H. Gilbert,* president, Gilbert-Davis Coal Co.

"First, marketing and, second, keeping production within range of consumption—the two biggest problems the coal industry must face not only in 1928 but in planning and safeguarding its future.

"In my humble opinion a step toward the accomplishment of the first proposition is to follow the United States Coal Commission recommendation.

"A step toward solving the second is by mergers. Both can and should be accomplished during the year 1928. By so doing it would result in the cost of production as well as price to consumers being maintained on a more even basis, thus benefiting the public, the operator and the miners.

"General business conditions in this country will not improve satisfactorily until there are some signs of better-

ment in the coal trade. The coal trade the world over is depressed with production far in excess of consumption and consequently intense competition and price below cost of production and short working time at the mines. Many less efficient or more difficult mines to operate, commonly known as high-cost mines, all over the world are gradually suspending operations indefinitely."

Adjustment to Conditions Confronts 1928

THE biggest problem in the coal industry arises out of the fact that the industry is in a transition period, writes *C. M. Moderwell,* president, C. M. Moderwell & Co. "It is trying to adjust itself to a state of affairs in which production exceeds consumption by at least 50 per cent.

"The solution of the problem will not be arrived at in the year 1928, nor for many years to come, but the logic of the situation is inexorable. No industry can be prosperous under the conditions that obtain in the coal industry at the present time. Those engaged in the industry will have to realize the facts and be prepared to act accordingly."

Coal Industry Must Face Own State of Mind

SUGGESTIONS that advertising, co-operation, uninterrupted operation, low wages, increased markets, reduced taxes and a thousand and one other things are a cure for the ills of hard coal as a marketable commodity are not even graspable, according to *John C. Haddock,* president, Haddock Mining Co., "unless the coal industry faces what I think is its biggest problem, and that is its own state of mind.

"Few of us seem to realize that the American public will buy what it wants regardless of cost, to a large extent, and certainly regardless of the wishes or hopes of any particular group or class of individuals within the public. Of course, through the medium of advertising, one may make the public think that it wants something. The questions of uninterrupted source of supply at a reasonable competitive cost with fairly low distribution charges all follow, but these are not fundamental.

"We have today a manufactured fuel with a sufficient demand therefor to average seemingly 80 per cent at least of the maximum yearly production. We have that through custom, habit and geography. It would seem to me that few other manufacturers have such a small gap between their assured demand and their maximum production, and an appreciation of this fact, rather than a complaint at our situation, is after all the fundamental problem. We have got to go after this 20 per cent and we have got to please the public all the time we are going after it, and we can't do that until we realize individually and collectively that we have always got to please the public. Advertising, service department, extra preparation and uninterrupted supply are all simply gestures. Back of the gestures there must be a unified intention."

Must Cut Production Costs And Raise Efficiency

THE 1928 problem of the coal industry is a two-fold one, involving lower production costs and greater efficiency per unit of labor and per unit of operation, according to *F. S. Pfahler,* general manager, Superior Coal Co. "We need and must have closer co-operation between employers and between employees and employers. I lay the blame for the present plight to both sides, due to the fact that neither side in the past has been willing to face fairly the facts, and until we do we will not arrive at a permanent solution.

"Some are of the opinion that mechanical loaders will correct our inequalities, but this is questionable. Mechanical loaders alone will not solve our problems, as we must have a wage adjustment. The amount of wage reduction is clearly open for debate.

S. Pemberton Hutchinson

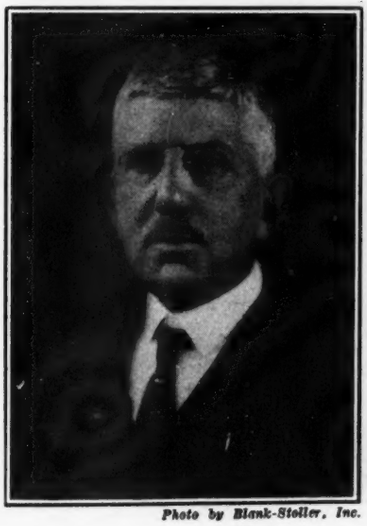


Photo by Blank-Stoller, Inc.

"Overproduction, we must all admit, can be cured by a process of elimination, which, I believe, will be brought about by the solving of the other problems of cost of production and will automatically apply to those who cannot obtain the greater efficiency and lower cost.

"Periodical strikes are a serious loss to both sides and it is not economically sound to expect the users of coal to waste money storing coal to protect the industry. The solution is, I believe, a long-time, flexible contract, a wage scale fair to employees and lower production cost. Both employees and employers should be willing to have all disputes upon which they cannot agree settled by parties equally fair to all concerned."

Intelligent Marketing Needed In Northern West Virginia

EACH district has its own peculiar problems to work out, in the opinion of *H. W. Showalter,* president, Continental Coal Co. "As to northern West Virginia, it is strictly a matter of intelligent marketing. Labor is plentiful and apparently satisfied and it would be unwise to disturb the wage scale; therefore the only other feature is marketing, which, in the absence of a common selling agency, can be improved only when each individual operator concludes that it is more advantageous to husband his raw material by leaving it in the earth than to continue his operations without a profit.

"The real solution, and not entirely original with me, is the organization of a common selling agency in the respective dsitricts and the sale of the product on a classified basis. When it is observed that one ton of beautiful coal sells for the same price as a one pound box of candy, it is apparent something is inherently wrong."

Urges Better Preparation And Research

CREATION of a bigger market is seen as the big job for the industry in 1928 by *James B. Neale,* president, Buck Run Coal Co. "A bigger market can be created in two ways:

"(1) By having the coal better prepared at the mines; (2) by scien-

tific research into better methods of burning coal. In the past years great strides have been made, as can be readily seen by comparing the old hand-fired cylinder boiler with the modern boiler mechanically fired, but the strides have not been sufficiently great to make a market for the output. Doubtless much more can be done by scientific research."

Overproduction, High Wages And Mergers Loom Large

THERE are three things that should be vitally considered by the larger coal producers: over-production, high wages paid to labor and the question of consolidation, according to *Geo. J. L. Wulff,* president, Western Coal & Mining Co. "The latter I have always thought should be given first consideration.

"There are several reasons why large mergers would be advantageous: (1) Reduction in executive expense. (2) Reduction in operating expense and economy in the purchasing department. (3) Reduction in selling expense and destructive competition.

"Everyone realizes that our laws are intended to prevent any approach to a monopoly, but I doubt very much if a monopoly is possible in the coal trade. Mines and the ownership of them are so scattered that it is my information that no more than 3 or 4 per cent of the total production is mined by any one company, and any consolidations or mergers should tend only to the elimination of loss and an earnest effort to realize a reasonable profit.

"The question of overproduction could be better handled if the coal industry was controlled by fewer companies, and it is my opinion that eventually this will be the question before the brains of our industry."

Same Old Problems Remain To Be Solved

THE coal problems of 1928 are about the same as for the last few years, namely, keeping the proper balance between producing and marketing, writes *Josiah Keely,* president, Cabin Creek Consolidated Coal Co. "It does not seem probable that this will be done by co-operation. Mine ownership is in too many hands for any get-together movement which might control supply and demand, even if permitted.

"Survival of the fittest is a slow process when each new purchaser of a bankrupt mine has a smaller investment to amortize and bases his earnings on what is left after the payroll is met.

"Since coal markets respond so readily to economic and industrial conditions and even to propaganda, a guess may be better than a forecast. A good guess would be that 1928 will see more buying up of bankrupt coal companies than ever before, not because the coal business will necessarily be worse but because the surplus money in the country will see more and more the necessity of making ownership of larger units the real basis for control.

"It seems likely that there will first be an endeavor to combine large holdings of coal of the same market values and similar industrial uses.

"Wages based on an every-day run and salaries based on real profits to stockholders seem more logical than artificial wages based on a part-time run and salaries of managers based on the paper value of the investment and the potential capacity of production.

"The movement to save the industry by mechanical loading will, if successful, save only those who mechanize and then only until all have become equipped.

"The industry requires both willing buyers and willing sellers."

Economic Law Will Be Coal "Czar" —Without Appointment

"IF THE suggestion recently put forward by the Secretary of Labor, that 'a czar be appointed for the coal trade,' with all the attendant powers of a czar, could be adopted, the solution of the coal industry's big problem would be comparatively easy," declares *F. H. Wigton,* president, Cunard Coal Co. "The expectation of such an overruling power is as futile as were foolish the other two suggestions from the same source.

C. E. Bockus

To make income equal expenses is the first great problem facing the coal industry this year, says Mr. Bockus, president, Clinchfield Coal Corporation. Next he warns against buying coal orders, holding that no sales should be made at less than cost of production.

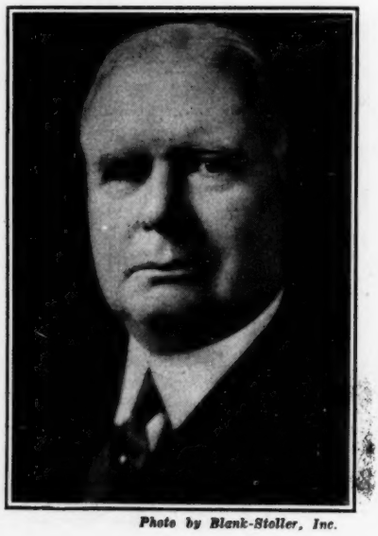


Photo by Blank-Stoller, Inc.

"The law of supply and demand has an uncanny way of getting in its work, sooner or later, in all business. The existing difficulties in the coal industry are, in a large measure, due to the maladministration of those who have been in control of governmental action for the past fifteen years, in the effort to counteract that well-known law.

"An analysis of the coal industry quickly shows the requirements of the country are somewhere about 10,000,000 tons per week, whereas the potential capacity to produce and transport that commodity is much in excess of normal requirements.

"The consumption of the country cannot be materially increased by any radical methods. Therefore to benefit the industry there remains only the reduction of the potential capacity for production.

"From 1914 until the present time, officials in the United States Government have been patting on the back and encouraging—for reasons which may have appeared good to them, but not beneficial for the country at large—the head of the United Mine Workers of America, and exerting their power to coerce the operators to do that which their business judgment did not sanction, and would not, under other circumstances, possibly have permitted, until at last a large portion of the coal mining industry has reached the 'impossible' and can go no further.

"Another branch of the government—namely, the Interstate Com-

merce Commission—having within its power to prevent, has nevertheless permitted an inequitable transportation schedule to work and continue to grow, until the logical result has become much in evidence. These two factors have brought about an excessive exploitation of the coal fields in this country, and now development is far beyond necessity.

"If the coal industry is to be reorganized and brought to a position where labor can receive a fair compensation, with a reasonable continuance of work, and the capital invested secure a proper return, drastic action is essential, and such action eventually will come about in spite of any theoretical ideas or communistic action. In the readjustment it is hopeless to believe no one will be affected.

"There are too many miners employed in the coal industry. One reason for such condition is the fact that in those fields hitherto dominated by unionism the rate of compensation paid has been excessive and out of proportion to that paid for similar labor in other industries. This has permitted labor to receive for less time of employment an aggregate amount sufficient to cover the time of idleness, and disproportionate to compensation in other industries, thus making for reluctance to abandon coal mining.

"The effort now being made to readjust the wage scale throughout what has been known as the union fields to a comparable basis with other labor would remove the incentive for many men to remain in the mining region when they could do equally well or better in other fields.

"This will bring about a reduction in the aggregate number of men in the coal-mining industry and scatter them in other employment, thus reducing the number of men and bringing demand and supply nearer equal.

"If the Interstate Commerce Commission, acting within its power, would readjust the transportation schedule on a more equitable basis, so that those coal fields which have been arbitrarily deprived of their natural advantages should be restored to their just position, then there would be a more equitable distribution among the coal fields in the production and marketing of their commodity.

"If these two factors were corrected, it is true that some coal fields which have been receiving an undue proportion of favor might be restricted, but justice and equity would have been secured, and that is what a 'beneficent czar' would endeavor to accomplish.

"The working of the law of supply and demand will produce the former. Whether the Commission will have the foresight and courage to do the latter is still a secret; but until these two problems shall have been solved the coal industry will remain in the vale of tribulation, with only the star of hope shining in the distant future to encourage it."

Would Solve Overproduction Through Mergers

OVERPRODUCTION is the curse of the industry, in the opinion of *Harry N. Taylor,* president, United States Distributing Corporation. "To solve this problem," he adds, "is a great deal bigger task than appears on the surface; but it is possible, if the ninety-two districts, as set forth in the Fact Finding Commission's report (Volume IV), were to have meetings within their several districts and consolidate their operations in each district through a sales agency or an absolute merger, centralizing production at the low-cost mines in each particular district, producing no more than the market will absorb of that particular kind of coal.

Photo by Blank-Stoller, Inc.

Harry N. Taylor

"In my opinion, this would not be contrary to the anti-trust laws, because there would be plenty of competition between the ninety-two districts; but it would straighten out the trouble within the districts from the operating, labor and selling standpoints."

Diagnosis of Ills Simple; Cure Difficult

"THE outstanding problem of the coal industry this year will be, as for several years past, overproduction," declares *James B. Pauley,* chairman of the board, Miami Coal Co. "The complaint is easy to diagnose; to find the cure is not so simple.

"This same difficulty is more or less prevalent in many other important lines, and it is evident that there is no simple means of relief. Surely the passage of laws, so often discussed, does not afford a solution of the problem.

"Possibly the assembling of the better class of properties into fewer and stronger hands, in so far as the statutes may permit, would be at least a partial relief.

"Those districts which, by reason of their special problems, are unable to obtain a fair share of the relatively little business available, are indeed in dire straits."

New Uses and Better Methods Must Be Found

"MY OPINION—concurred in by government officials, the operators and the miners—is that the industry's biggest problem is overproduction," writes *Andrew B. Crichton,* president Beachly Coal Co. "This question bothers not the coal industry alone, however, but nearly every other industry. The cure is either to curtail production or increase consumption, and the problem is how to do either or both.

"Overproduction naturally refers to the capacity to produce, because, after all, production is no greater than consumption. Forcing coal on the market and the intense competition resulting has reduced the selling price far below cost of production in many instances. With productive capacity at least 50 per cent greater than present consumption, a slight increase in consumption only results in more coal being produced, and lasting results cannot be expected soon from that source, except locally.

"The industry is more dependent upon research now than ever before. Lower cost and better preparation through improved mining methods will help bituminous coal compete with its rivals—natural gas, oil, water power and even anthracite. The finding of new uses and improved methods for coal and its many byproducts

is gradually increasing consumption. Increased efficiency in the burning of coal in its raw state, particularly pulverized coal, will greatly help, and soon the consumption of coal will again keep pace with increasing population.

"After all, the whole trouble is the low price at which we are selling our product. To help the situation we must increase the selling price, to afford a reasonable profit. I am told the law does not permit price fixing or understandings as to price, but surely mergers and consolidations mean nothing else than reduced cost and increased sales realization, and they must come through one means or another.

"The most immediate results can, and undoubtedly will, come from consolidation of sales efforts. The past depression in the coal business has surely had its compensation in reduced operating costs, better preparation and increased uses through research, and much of the trouble has already been discounted. I am one who looks forward to better times not far ahead."

Consolidations in Various Fields Would Insure Fair Profit

A CONSOLIDATION of coal properties in the various fields would be very beneficial to the coal industry as a whole, writes *C. F. Richardson,* president, West Kentucky Coal Co., "and I do not mean to convey the idea that any field should be entirely under one consolidation plan. If several consolidations could be made, the number being determined by the size of the field in which these consolidations are worked out, it would make it possible to maintain a price for coal which would at least return to the property the cost of production, including fixed charges, and in addition to that a reasonable margin of profit should be expected.

"A great deal has been written and advertised with reference to the meat packers only realizing a profit of a fifth of a cent per pound on their product. If the coal producers could realize 10c. per ton above all fixed charges, I am quite sure that every operator would be very happy and the coal business would be on a very much better basis.

"Unfortunately, many operators do not charge in to their cost of production, when they are cutting prices, anything but the labor and supply cost, disregarding depreciation, depletion, taxes, insurance and interest on capital investment. This, of course, is more prevalent among the smaller operations than the larger ones, but it is the small operations that fix the price for the large operations, and this has more to do with the low prices being received for coal than probably any other one thing.

"Everyone knows that the coal industry has been developed generally very much in excess of the requirements and until there has been a permanent closing down of many mines and more consolidations of small properties and probably larger ones and until there is a system of intelligent bookkeeping made effective in every coal-producing company—and this system should be so arranged that every item of expense is charged into the cost of coal that legitimately belongs there, such as depreciation, depletion, interest on capital investment, insurance, taxes and compensation insurance—we are going to continue to suffer the ills of an industry which is not being intelligently handled.

"When new mines are being opened in many cases—in fact most cases—the owner thinks because he has a low cost of production when the coal is close to the shaft or slope that he is going to continue to have this low cost of production and makes prices accordingly, when in reality there should be a substantial reserve set up to take care of the increased expense as the mine grows older. There are so few companies that ever think of this condition that it is almost an unknown item of expense, but it comes later on, to the sorrow of the individual owner or corporation.

"I have called attention to only some of the principal ills of the coal industry. I might add that the production of small operating mines usually is sold through a broker or coal sales agency, and in many cases these brokers or sales agencies have only one thought in mind and that is to move tonnage regardless of price to the operator.

"In most cases orders are taken by the broker or sales agency and then peddled out to the small operators at prices which they know are destructive and suicidal to accept, but on account of their not being in position to market their own coal they are compelled to accept these orders and the broker or sales agent collects a commission, which, of course, is perfectly legitimate. It is always easier for the broker or the sales agent to sell coal a nickel or a dime under the price being made by a company that produces and sells its own coal and during soft market conditions this always compels the producing company with its own selling agency to meet the price of its competitor.

"This situation would be considerably improved, if not entirely eliminated, if the coal properties were consolidated and each company in the consolidation maintained its own selling agency or else had a management which had the courage to ask a price for the product that would at least meet the cost of production, including all fixed charges.

"I am always optimistic about the future in the coal business, for I believe that operations having good quality coal and preparation kept up to a high standard, with a live selling organization and average management will continue to prosper. While there may be off years, in the long run a company such as I have referred to will continue to make a reasonable margin of profit on its investment."

Can't Expect Much Progress In One Year

"IT CANNOT be expected that the coal industry's biggest problem will be solved, nor can there be any considerable permanent progress, within the year 1928," states *P. J. Quealy,* president, Kemmerer Coal Co. "Problems which most affect the coal business at present, however, are as follows:

"(1) Overproduction, which could be greatly improved by consolidation of as many of the smaller operators as possible, and to include the larger ones if possible, handled by one sales department.

"(2) Labor adjustment by arbitration under jurisdiction of state or federal government where the employee and employer cannot agree.

"(3) In districts where the state or federal government owns or controls coal lands subject to lease or sale, before lease or sale is made, said

owners should be required by law to determine whether or not the mines then in operation are amply sufficient to supply all the coal required within the district operating under competitive transportation rates; and if sufficient, no lease or sale should be made except to those having a mine or mines adjacent to any such lands, or approaching depletion so as to reduce necessary production of such mines or company then in operation, providing the equipment of such operation be such that the coal from such adjoining lands can be produced more economically than it could otherwise be produced."

Hold Output to Consumption, Is Suggested

REGULATION of production to the consuming needs of the nation so that the price of the product will pay its delivered cost at no sacrifice along the line to any individual necessary to that economic production is seen by *W. A. Richards,* president, Majestic Collieries Co., as the industry's burning question.

"This can best be accomplished by either the consolidation of coals of like kind and character into single operating and selling units or through regulation by governmental commission of minimum prices in respective fields. Either of these methods would eliminate the deadly intra-field competition and let survive the economical and desirable competition between coals of different kinds and character, based on their delivered cost as compared to their quality and usefulness.

"By these methods the present struggle among mines for existence in the future would be carried forward to a successful conclusion without the present danger of the uneconomic fellows also destroying the economic mines in the elimination process."

High Costs and Instability Cast Dark Shadows

"THE biggest problem confronting us for 1928," says *John H. Jones,* president, Bertha-Consumers Co., "is the question of reducing the cost of producing coal and the stabilization of the market. This could be accomplished as follows:

"(1) By the merging of coal companies in different districts, the elimination of high-cost mines and operation of the most modern mines, thereby reducing the cost of producing coal. (2) By the different districts being permitted by the government to co-operate in the stabilization of market conditions.

"The above methods would enable the producers to pay a living wage and at the same time produce their coal at a minimum cost."

Photo by Blank-Stoller, Inc.

John H. Jones

Says Survival of Fittest Is Only Solution

"THE greatest problem in the coal industry today, I think, is overproduction, and in the union fields it is high wages," writes *Chas. S. Keith,* president, Central Coal & Coke Co. "I do not believe overproduction can be solved, except through the survival of the fittest. I believe the survival of the fittest also will solve the labor problem."

Hears Many Remedies; None Practical

"IT IS very difficult to tell at the present time what is the biggest problem for 1928 the coal industry must face," is the opinion of *L. Rodman Page, Jr.,* treasurer, Crozer Coal & Coke Co.

"We all know that at present there is a capacity for overproduction with no practical means of curtailment at times when the market is flooded with coal. Just how this phase of the situation can be bettered is the gravest question which, in my mind, is facing the industry today. I have heard plenty of suggestions as to the solution of our problem, none of which, in my opinion, is entirely practical."

Suspicion Blocks Co-operation Among Operators

"SINCE it is reported that the majority of the coal companies are losing money in operating their mines my opinion is that the biggest problem the coal industry must face in 1928 is to 'produce coal and sell it at a profit'," states *A. J. King,* president, King Fuel Co. and associated companies.

"There are two reasons why we may not expect anything in the way of co-operation among coal operators in disposing of their product. The first is that they seem to be more or less suspicious of one another. The second is that they have an abiding respect for the federal anti-trust statutes governing combinations in restraint of trade.

"The problem then can be solved only by low-cost production, which involves regular operation, a maintenance of the morale of the organization by paying fair wages, good and safe mining methods, the utilization of labor-saving equipment and the proper preparation of the product for the market. In addition to this we would suggest that some attention be given to the adaptability of the coal produced for particular purposes."

Overcrowded Market Impedes Chance for Profit

THE biggest problem facing that portion of the bituminous coal industry that is dominated by union labor is the decision as to whether it will continue to be dominated, controlled and interrupted by the policies of the United Mine Workers, in the opinion of *J. G. Puterbaugh,* president, McAlester Fuel Co. "Perhaps the biggest problem for the industry as a whole is how to place, in an overcrowded market, sufficient tonnage to reduce costs to a bearable figure and to realize, above cost, a profit.

"In my judgment the industry should act on the suggestions already made by President Coolidge and Herbert Hoover, viz., that the Sherman anti-trust law be so amended as to allow centralized marketing by districts or price agreements by districts. This would make it possible to eliminate irresponsible and ill-advised price cutting and reduce marketing to an intelligent competition between districts.

"It is not healthy or best for the

(Turn to page 17)

Coal Mine Fatality Rate *Lower in 1927* Than in Previous Year

By Scott Turner
Director
U. S. Bureau of Mines

THE prevention of accidents in mines always has been a featured activity of the United States Bureau of Mines; to the limit of its resources in money and personnel, prevention work has been continued by the Bureau. Many organizations and individuals are working unremittingly to this same end, and it is worth our while to pause at the end of each year long enough to take stock and see whether progress is being made in lessening the number of accidents underground.

The Bureau maintains, in its economics branch, a division of mineral statistics, and in this division functions the mine accident statistics section. To this section we turn for the facts and figures which will demonstrate whether we are gaining or losing ground in our ceaseless fight against accidents in mines. The following summary is based on information furnished by this section, through its head, W. W. Adams, a statistician well known to almost everyone in the mining industry.

It is with pleasure that we can unqualifiedly state that 1927 was a year of progress in safety at coal mines. Fewer men were killed by accidents and the death rate per ton of coal produced was lower; there was a wider use of rock dust, to prevent or limit explosions of gas or coal dust, and a resultant decrease in loss of life from explosions. These were outstanding safety features during the year.

FEWER deaths from accidents were to be expected, for many mines in the Northern coal fields were closed, but the death rate in relation to actual tonnage also was reduced, which means that each ton of coal cost less in human life in 1927 than in 1926. The production of coal during the year was about 7 per cent less than in 1926. Figures for the first eleven months show a death rate of 3.62 per million tons. Experience indicates that additional deaths must be expected from injuries that have not yet proved fatal; judging from past records, these additional deaths may increase the fatality rate about 3 per cent.

The rate for 1927, when finally revised, will be close to 3.73 per million tons. The previous year's rate was 3.83. The year 1927, therefore, witnessed another decline in the human-life cost of coal—a decline that has been going on persistently, although rather slowly and with some interruptions, for many years. Present indications are that the death rate for 1927 will prove to be one of the lowest on record. The improvement was entirely in the bituminous branch of the industry. The rate for anthracite mines was somewhat higher than in 1926.

UNREVISED figures show that the actual number of men killed by accidents in coal mines of the United States during the first eleven months of 1927, was 2,002. Assuming that later returns will increase this figure about 3 per cent, final reports will show 2,060 deaths for the eleven-month period as compared with 2,264 deaths during the corresponding period of 1926. About 200 lives were thus saved in 1927. The saving cannot all be credited to accident-prevention work; part was due also to the fact that many mines were not in operation during the year. Perhaps one-fourth of the saving was due to safety work and three-fourths to the closing of the mines. Practically all the reduction in the death rates was in two classes of accidents, viz., gas and dust explosions and haulage accidents.

Scott Turner

FALLS of roof and coal in 1927 will show a slightly higher death rate than in 1926. Allowing for accidents yet to be reported, the death rate will be about 1.89 as compared with 1.83. Accidents from falls usually cause nearly half of all coal-mine fatalities. The human element seems to enter more largely into their occurrence than in accidents of other types. These considerations led the Bureau to assign one of its senior mining engineers exclusively to the study of causes of falls and methods for their prevention.

The prevention of accidents from falls is perhaps the most difficult problem that confronts the mining industry. It is not a problem peculiar to the United States; all coal-mining countries have found that this type of accident is more baffling than all others with which they have to deal. The problem in our country, however, is more serious than elsewhere because of our higher death rate per man employed. Fortunately, our machine methods of production, which have been made possible by favorable mining conditions as well as by American ingenuity, usually gives us a larger tonnage of coal per death from

falls than has yet been accomplished in other countries.

The proportion of underground employees engaged in actual mining work in American mines is higher than in most other countries. This means that a relatively larger number of men who work underground are employed at the working face. Nearly 90 per cent of all fatal accidents from falls of roof and coal occur at or near the working face. Therefore, a larger proportion of the underground men in American mines are exposed to the principal hazard of coal mining, namely, falls of roof and coal. This partly explains the higher death rate per man employed in the coal mines of the United States.

IN THE coal mines of foreign countries, on the other hand, a relatively larger number of employees underground is engaged on what, for want of a better term, may be called non-mining work, that is, work relating to haulage and to the upkeep of the mine. Ordinarily fewer accidents occur in the so-called non-mining operations underground, and this fact accounts, in some degree at least, for the lower accident rate per man employed in the coal mines of some European countries. It should be stated, however, that natural conditions, rather than choice, make it necessary in European mines to employ so large a proportion of upkeep men and other non-mining employees underground. Yet their presence underground and their employment on work of a less hazardous nature result in a lower death rate when calculated on the total number of men employed underground.

Purely mechanical or engineering methods tending to reduce the number of accidents from falls of roof and coal are relatively simple. A knowledge of them suggests more systematic timbering to support the roof, more systematic and careful examination of the roof and the removal of loose rock, adequate supply of suitable timber, prompt delivery of cars in sufficient number to discourage loading before making the working place safe, closer supervision by mine foremen, and more insistence by foremen on compliance with their safety instructions, even to the point of remaining on the spot until their instructions are carried out by the miners.

It is a simple matter to state obvious remedies. The difficulty is in having known remedies applied. Herein enters the human factor, the chief factor in the causation of accidents. Careless employees do not always obey safety instructions. Careless companies do not always insist upon obedience. A careless miner deserves the same treatment as the miner who will not dig coal. The notorious taker of risks should be dealt with the same as the employee who will not work. Unwillingness or inability to produce safely should be considered as serious as unwillingness or inability to produce at all.

Haulage accidents caused 16 per cent of the total number of fatalities in 1927. The death rate per million tons was, from present indications, 0.581, as compared with 0.664 in the preceding year, a reduction of 12 per cent. A reduction in the death rate from haulage accidents is particularly gratifying, because haulage, which ranks second among the major causes of fatal accidents, has shown a rising death rate in recent years, and any material reduction in the death rate such as that indicated for 1927 means a saving of many lives.

IT IS imperative that conditions likely to cause haulage accidents be closely watched. Coal or other material on walkways paralleling the track and inadequate clearance between track and side are among the chief causes of accidents of this class. These are conditions for which the operating company must take the main responsibility. Carelessness of employees in coupling cars or in boarding or jumping from cars or motors also are prolific causes of accidents. Longer hauls and more rapid operation of cars to convey increasing quantities of coal from the face to the tipple are likely to raise the haulage-accident rate unless operating companies and their employees give more than ordinary attention to the condition of tracks and haulageways and to the proper construction and use of cars and motors. Almost as many miners as haulage employees are injured by cars and motors. Hence the prevention of accidents of this type is a matter that requires the co-operation of all classes of employees who work underground.

Explosions of gas and dust, and the number of deaths resulting from them, were fewer in 1927 than in 1926. The apparent death rate for the year was 0.419 per million tons, a reduction of 34 per cent from the rate for the previous year. The reduction in the rate was entirely in the class of accidents known as major disasters—that is, accidents in which 5 or more lives were lost. Only 9 major disasters, with a loss of 162 lives, were reported for the past year, as compared with 16 such disasters and a loss of 348 lives for 1926. The death rate from explosions of a non-major character—those that killed 1 to 4 men—was about the same as in 1926. It is reasonable to believe that the campaign to bring about a more widespread use of rock dust in bituminous coal mines has contributed, indirectly as well as directly, to the improvement in the industry's experience as to major explosions in 1927.

Information obtained by members of the Bureau's staff showed that on July 1, 1927, there were 485 mines using rock dust. There were 7,177 mines that produced bituminous coal in 1926. From these figures it is apparent that less than 7 per cent of the bituminous coal mines are using rock dust. The production of coal in

THE MINE OPERATOR should place the careless worker and the non-producer in the same category and allow neither to remain in the mine. Failure to exclude the careless worker indicates carelessness on the part of the company. In case of accident under such circumstances the chief responsibility is upon the company. We must look to operating companies to produce two commodities, namely, safety and tonnage. The production of either without the other is an economic waste. Companies that will not tolerate a careless employee are the real contributors to the safety movement in the coal-mining industry.

mines that used rock dust represented 24 per cent of the country's total output of bituminous coal in 1926. The average production of the mines that used rock dust was about 300,000 tons per mine. The 485 mines were situated in 17 of the 30 coal-producing states. No rock dust was reported in use by mines in Arkansas, Iowa, Michigan, Missouri, North Carolina, Texas or Virginia, although some of these states have suffered disastrous explosions.

Whether all of the 485 mines using rock dust were using it efficiently or not, the Bureau does not know. The information was merely to the effect that rock dust was being used. It is suggested that the managements of all mines using rock dust assure themselves that the dust is being properly used to prevent or limit explosions. The Bureau also urges the use of rock dust by all mines that have not as yet adopted this method of safeguarding the lives of their employees.

The death rate from accidents caused by explosives in 1927 was somewhat higher than in 1926. The indicated rate was 0.198 per million tons as against 0.140 in the previous year. Fortunately this class of accidents does not usually take a heavy toll of life, as do haulage accidents and falls of roof and coal. The annual death toll usually involves about 100 lives. In a number of cases, particularly in those occurring some years ago, explosives have been the initial cause of explosions of gas or dust that have resulted in heavy loss of life. Most of the deaths in such cases have been due mainly to the presence of gas or coal dust and therefore have been classified under the heading of explosions.

As a direct cause of death from burns or flying objects, explosives cause about 5 per cent of the annual loss of life from accidents in coal mines. Most of these accidents result from premature shots or from returning too soon after blasting. The majority of these accidents are avoidable with reasonable care. As a safety measure the Bureau urges the use of permissible explosives exclusively for blasting in coal mines. The increasing use of permissible explosives, while gratifying, is not as rapid as mine safety requires. Large quantities of black blasting powder and dynamite are still being used, and these classes of explosives have been the chief cause of accidents from explosives in coal-mining operations. Every reasonable safety precaution in blasting should be adopted by the mining industry, so that each ton of coal may be produced with the minimum loss of life and property.

DISASTROUS explosions have been caused by sparks from trolley wires, open-type switches or other electric equipment in coal mines; in fact from one-third to one-half of our present-day explosions originate through electrical ignitions. When such accidents occur they are classified under the heading of explosions, because the principal destructive agent in such accidents is the gas or coal dust. Aside from explosions thus caused, electric shocks or burns have caused from 68 to 95 deaths annually during the past ten years, representing from 3 to 4 per cent of the total number of deaths from all classes of accidents.

Electric power is being used by an increasing number of coal mines each year. As a means of increasing efficiency, the use of electricity has effected marked progres in coal mining. However, electric equipment introduces new hazards into the mines, particularly when the equipment is of open, or "non-permissible," types or when the wiring and other details of installation are not made and maintained carefully. Motors, mining machines and other electric appliances submitted by manufacturers for tests by the Bureau of Mines, and having passed such tests to determine their suitability for use in coal mines, offer the most promising means of reducing the number of deaths and injuries from electric shocks and burns, as well as from explosions caused by ignition from electric sparks.

Failure to use electric equipment that has passed such tests has been the cause of many deaths among coal miners. Yet many mines and, in some heavily producing states, nearly all mines, continue to use electric equipment of "non-permissible" types, although such equipment constitutes a constant hazard to those who use it and to all other employees in the mine. This is one of the unnecessary hazards of mining which the Bureau believes the industry should remove at the earliest possible date.

During the fiscal year ended June 30, 1927, training in methods of first-aid or mine-rescue work was given by the Bureau's engineers to 39,200 persons, in 581 mining, metallurgical, quarrying or oil-producing communities in 40 states and Alaska. This is a record number of persons for any one year, and brings the total number trained by the Bureau since its creation and until the end of the Bureau's last fiscal year, June 30, 1927, to 206,425. About one million persons are employed in mining coal and other minerals, but the number trained to date does not represent one-fifth of the number employed, because of the high labor turnover in the industry. Considerable work remains to be done among employees who have thus far received no training at all. In this work there is hope for more rapid progress, since the mining companies are now co-operating actively, in many instances with the intent that all employees instead of a selected few shall have first-aid knowledge.

SAFETY WORK of this kind receives great impetus from the annual contests which the Bureau of Mines conducts or in which the Bureau gives active assistance. The

THE EFFECTIVENESS of rock-dusting in preventing or limiting coal-mine explosions has been convincingly demonstrated. On the other hand inadequate or unsystematic rock-dusting may create a false sense of security. Rock dust can give no assurance against explosions unless it is kept properly applied to all accessible areas of the mine. Experiments by the Bureau of Mines have shown that the dust must be applied at such times and in such quantities as will insure more than 65 per cent of incombustible content to the mixture of rock dust and coal dust in all parts of the mine.

contests, known as the International First-Aid and Mine-Rescue Contests, are forwarded by the Bureau and much aid of various kinds is given by the mining industry. The most recent of these contests conducted by the Bureau was that held at Pittsburgh, Pa., Aug. 30, 31 and Sept. 1, 1927. It was participated in by 65 teams representing companies in 13 states, and included the anthracite and bituminous coal mining, metal mining, quarrying and oil industries.

That coal mining can be made relatively safe has been shown by the records of the national safety competitions conducted by the Bureau during the past three years. Results of the contest of 1927 are not yet closed, but in 1926 the leading mine in the bituminous coal-mine group, employing about 400 men, had only seven lost-time accidents. The total loss of time from these accidents was only 165 days, the accident-severity rate for the mine being 0.2 per thousand man-hours, as compared with 7.5 for all mines in the bituminous group.

Sixty-nine per cent of the bituminous coal mines had accident rates lower than the group average. These facts constitute strong evidence not only that individual mines can be made relatively safe but also that the accident rate for the industry as a whole is at its present level largely because of the much higher individual rates for a relatively small number of mines. The combined rate for bituminous coal mines having lower individual rates than the group average was 4.34 per million man-hours; the remaining companies had a combined rate of 27.44, or more than six times as high an accident loss as the better companies that comprised 69 per cent of the number of mines in the group.

Similar information for coal mines for 1925 and for metal mines and quarries for 1925 and 1926 tends to confirm the impression that the accident rate for the mining industry would be much lower than it is except for the high accident rates of about one-third of the operating mines. The close agreement between the average rates for these small groups and the average rates for the entire metal mining and quarrying industries further strengthens the impression.

To epitomize the whole matter of mine safety, so far as the opinion of the Bureau of Mines is concerned, the mine safety board of the Bureau has formulated certain recommendations for increasing safety in coal mines. These recommendations, when approved and issued by the Director, become the Bureau's official opinion as to what the industry can do to lessen the hazards of mining. Three decisions of the mine safety board were approved prior to 1927. The first and second decisions recommended the use of permissible lamps exclusively for illumination and gas detection in coal mines and the use of none but permissible explosives for blasting. Decision No. 3 stated the Bureau's belief that all coal mines are potentially gassy, but that for administrative purposes certain classes of "practically non-gassy," "slightly gassy," and "gassy" mines should be recognized. Each of the three classes was defined.

Decisions Nos. 4, 5, 6 and 7 were approved and issued in 1927. Decision No. 4 recommended that auxiliary fans or blowers should not be used in coal mines as a substitute for methods of regular and continuous coursing of the air to every face of the mine. Decision No. 5 recommended the rock-dusting of all coal mines except anthracite mines, and also that rock-dust barriers be used to sectionalize the mine as additional defense. Decision No. 6 recommended that in coal mines all entries, rooms, panels or sections that cannot be kept well ventilated throughout or cannot be inspected regularly and thoroughly, or that are not being used for coursing the air, travel, haulage or the extraction of coal be sealed by strong fireproof stoppings. Decision No. 7 recommended that the main intake and main return air currents in mines be in separate shafts, slopes or drifts; that the main intake shaft lining be of fireproof construction, and that there be a minimum amount of inflammable material in or adjacent to the shaft.

The foregoing recommendations were made in the interest of safety in coal mining. It is believed that their adoption by the industry will greatly reduce the yearly losses which accidents cause to life and property.

THE COAL MINING INDUSTRY can be made much safer than it is. Individual companies have clearly demonstrated the truth of this statement. The fact that two-thirds of the industry is already operating with accident losses totaling only one-sixth as heavy as those of the remaining one-third of the companies indicates the great contribution to mine safety which a relatively few companies might make. What the year 1928 shall reveal will depend in large measure on what one-third of the operating companies do during the next twelve months to increase safety in their mines.

Coal's Big Problem in 1928

(Continued from page 13)

country that so large and basic an industry as the mining and marketing of coal should continue in its present disorganized and unprofitable condition. The industry has not even made a start toward any kind of systematic co-operation along any important line. If obtainable, a modification of the Sherman anti-trust law would make a start possible. If intra-district competition could be largely eliminated, the most disagreeable and hazardous element of the industry could be overcome.

"As bad as conditions are, I think the industry has made substantial progress during the past year."

Low-Wage Competitors Worry Iowa

IN IOWA the biggest problem is the production of coal at a figure that will permit the operators to sell their product in competition, first of all, with coal from the Southeastern fields, which are blessed generally with the highest quality, very favorable freight rates into this consuming territory and a wage scale a great deal lower than the union scale under which it has been necessary to produce Iowa coal, writes *George Heaps, Jr.*, president, Iowa Coal Operators' Association. "In addition to this we must meet the competition of coal from parts of Illinois and Indiana,

(Turn to page 42)

WHAT'S AHEAD
for the Soft Coal Industry

By E. C. Mahan
President,
National Coal Association

DOWN in Tennessee they tell the story of a conversation which took place when two colored women met on a country lane. "Well, Miranda, where are you going this morning?" asked Mary. To which Miranda replied, "I'se goin' nowhere, Mary. I'se been where I'se goin'."

This suggests the message that I should like to get across to every coal operator: namely, that the business of coal mining, or any other business, for that matter, cannot be carried on successfully in the fashion that Miranda functioned. In order to succeed in this day and age a business must go on, from one objective to another. It simply cannot afford, at any time, to be "goin' nowhere."

In sketching briefly for *Coal Age* the 1927 record of the bituminous coal industry and the prospects for 1928, I decided that the wisdom of an affirmative answer lay in the opportunity to press the point that, in order to remain in business in this competitive age, it is necessary to establish very definite objectives respecting sales and every other line of business activity. And, whenever an operator sets out earnestly and intelligently to do that, there will soon dawn upon him the understanding that he must know his costs.

In a statement of this sort some reference to production and stocks, along with observations on business trends, is expected, but what is the use of talking about the number of carloads which have been shipped from our tipples if we don't know what it has cost us to produce the coal? To understand why some operators persist in the obnoxious trade practice of selling coal below cost it is only necessary, in many cases, to know of the utter lack of a proper accounting system. Of course, there are other factors, but this is of cardinal importance.

There were 55,000,000 tons of bituminous coal in the hands of industrial consumers on Jan. 1, 1927, and on Oct. 1 the stockpiles had risen to 61,000,000 tons, according to government reports. From present indications—these words are written in early December—stocks will be reduced to about 50,000,000 tons by Jan. 1, 1928. In some quarters it is thought the reserve will get as low as 40,000,000 tons, but the burden of opinion places the figure from four to six million tons higher.

E. C. Mahan

Production for 1927 probably will total not much below 520,000,000 tons, as against 573,000,000 for 1926 and an average production of 481,000,000 tons for the five-year period 1921-1925. About 18,000,000 tons of the 1926 output was accounted for by additional exports due to the British strike.

IF stockpiles are about 50,000,000 tons Jan. 1, as against 55,000,000 a year ago, we can add 5,000,000 tons to 520,000,000, the estimated production for 1927, which gives 525,000,000 tons as the total bituminous coal consumption plus exports. That figure is closely in line with what might be expected from business indices and indicates that such inroads as are being made on consumption by increased combustion efficiencies are being offset by new business, by recovery of tonnage from fuel oil and by acquisition of new markets in anthracite territory.

The coal industry is still in a period of transition, which makes it venturesome to predict what will happen in such a short space of twelve months. I think that, despite a Presidential election, business conditions will improve with a consequent betterment of the coal business, *Unless,* with a capital U, operators continue to sell their product for less than cost. If they do that, coal requirements, owing to the excess capacity of the industry, will have slight bearing on prices. I am hopeful that in 1928 there will be a fair balance between the two fundamental factors, consumption and production, in which event, should business principles be adopted, conditions would be more satisfactory.

Treating of the future of the industry during the next decade I see more ground for optimism. In this power-hungry age there is no question but that the nation will turn more and more to coal to supply the ever growing demand for power. It is practically certain that in the next decade we will witness greatly increased uses of coal in low- as well as high-temperature distillation plants, making everyone in the coal business more hopeful of the future than at the present.

THE modern swing toward consolidation is being felt with increasing effect. This may be, as Shakespeare said, "the winter of our discontent," but we are not alone, and the prospects of many companies engaged in other lines of business are no more promising than ours. There remains the task of getting our house in order, for what will it profit us to sell more coal if we sell it under cost? I am confident we are going to get our house in order, because the National Coal Association has tackled the job and is proceeding in a workmanlike manner. At first it seemed about as difficult to get a grip on the subject as to obtain a firm hold on the oiled body of a wrestler, but our program is headed in the right direction and definite progress is being made.

NO MAN'S LAND *in the Coal Industry*

The Economics of Distribution

By O. E. Kiessling and F. G. Tyron

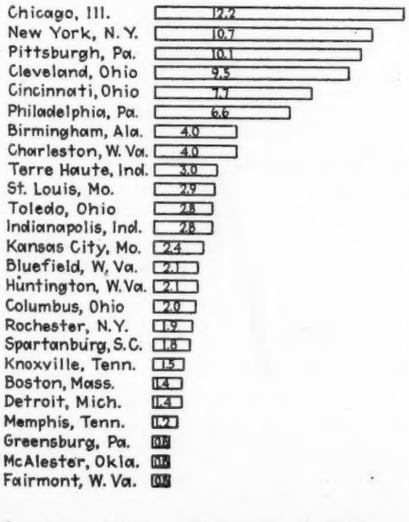
THIS study, which shows the important sales agency centers in the bituminous coal trade and the proportion of the district output produced by mines maintaining connections with separately incorporated sales agents, is an expedition into the dark continent of our knowledge about the coal industry—the economics of distribution.

The ten leading cities in order of tonnage handled by separately incorporated sales agents during 1921 were Chicago, New York, Pittsburgh, Cleveland, Cincinnati, Philadelphia, Birmingham, Charleston (W. Va.), Terre Haute and St. Louis. Lesser centers, such as Indianapolis, Bluefield (W. Va), McAlester (Okla.), and many others were scattered over the country.

A total of 661 agents in these centers were supplied by 1,581 mining companies that produced 112,574,996 tons—slightly more than 27 per cent of the total production for 1921. The proportion of the district output produced by mines with sales agents ranged from 2 per cent for Washington to 62 per cent for the low-volatile district of southern West Virginia.

The year 1921 was selected because it is the only one about which we have any background of statistics of coal marketing against which to set the results of this study. In contrast to the detailed figures of production, very little is known about the quantity of coal passing through the several channels of the wholesale trade.

Fig. 1—The 25 Leading Cities in Tonnage of Soft Coal Handled by Separately Incorporated Sales Agents. Figures in Bars Represent Million Tons in 1921



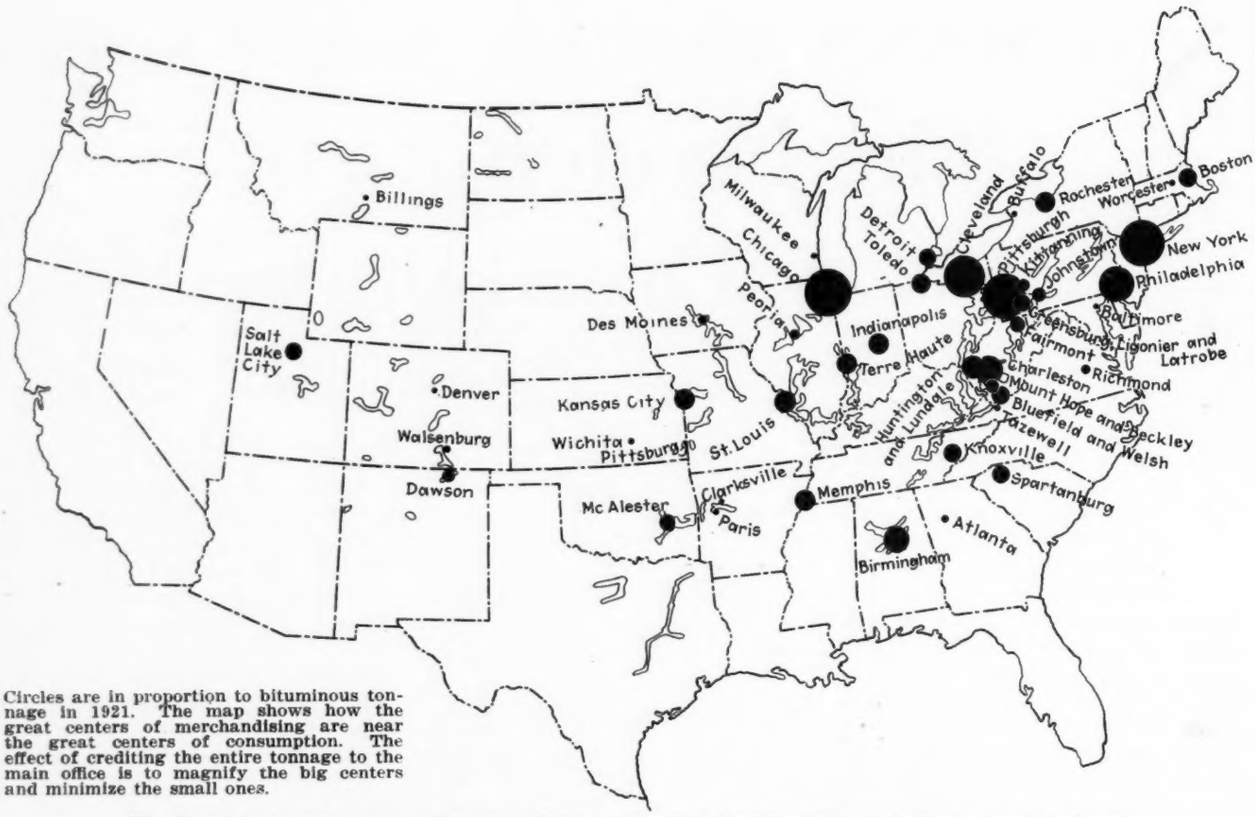
WERE it not for the lack of statistical information on the subject, anyone writing of 1921 would feel like a vendor of old eggs, but as a matter of fact, with the shift in centers of production farther south, the wholesaler remains an indispensable element in the coal trade, and the broad relations between producing fields and sales agency centers probably are much the same. Indeed the shifts in business have tended to increase the proportion marketed through sales agents because of the rapid growth of eastern Kentucky and West Virginia, in which this method of distribution is widely employed. It must be remembered, also, that 1921 was a year of depression with an output 27.5 per cent less than that of 1926, and that had a later year been selected the tonnages shown would have been correspondingly larger.

The information presented herewith was derived in part from the 1921 edition of the *Keystone Coal Catalog* and in part from the records of the U. S. Geological Survey (since transferred to the Bureau of Mines). Among other facts, the editors of the *Keystone Catalog* ask each mining company for the "name and address of sales agent or company selling your output." The catalog therefore was searched for mines listing a separate company as sales agent or listing a person who was known to be an officer of a separate sales company. For all such mines the name of the sales company and location of its main office were recorded, and opposite them was set down the production of the mine in 1921. Mines reporting as sales agent a person employed by the mining corporation were not recorded, as such mines evidently maintained their own selling departments under the same corporate name. The results were tabulated both according to the city in which the sales agent's main office was located and according to the district in which the mine was located.

The result is a rough measure of the quantity of coal handled by separately incorporated sales agents. It is rough because doubtless there were many operators naming a separate agent who did not sell their entire product through that agent, and no doubt other operators who did not name a separate agent did at times sell through such an agent. Very clearly the figures exclude most of the sales made direct to the consumer by those operating companies maintaining selling departments under their own corporate name. On the other hand it is not so clear how much of the tonnage handled by independent jobbers is included in the figures. Undoubtedly some mines reported sales agency connections with companies which were primarily jobbers.

THE line between the independent jobber and the sales agent on commission always is hard to draw, because few wholesalers confine themselves absolutely to either one arrangement or the other. The probability is that some, but by no means all, of the jobbing transactions are included in these figures and that the total of 112,000,000 tons falls short of the sales of the wholesalers of all types in 1921.

It should be noted also that there are separately incorporated sales agencies so closely affiliated with mining companies as to resemble the selling departments of producing companies. We have made no attempt to distinguish such companies, which



Circles are in proportion to bituminous tonnage in 1921. The map shows how the great centers of merchandising are near the great centers of consumption. The effect of crediting the entire tonnage to the main office is to magnify the big centers and minimize the small ones.

Fig. 2—Principal Centers in Tonnage Reported as Handled by Separately Incorporated Agents

have their own reasons for separate incorporation from the non-affiliated companies. The test applied in classification has been the separate corporate name or, in the case of a partnership or individual enterprise, the separate name of the firm.

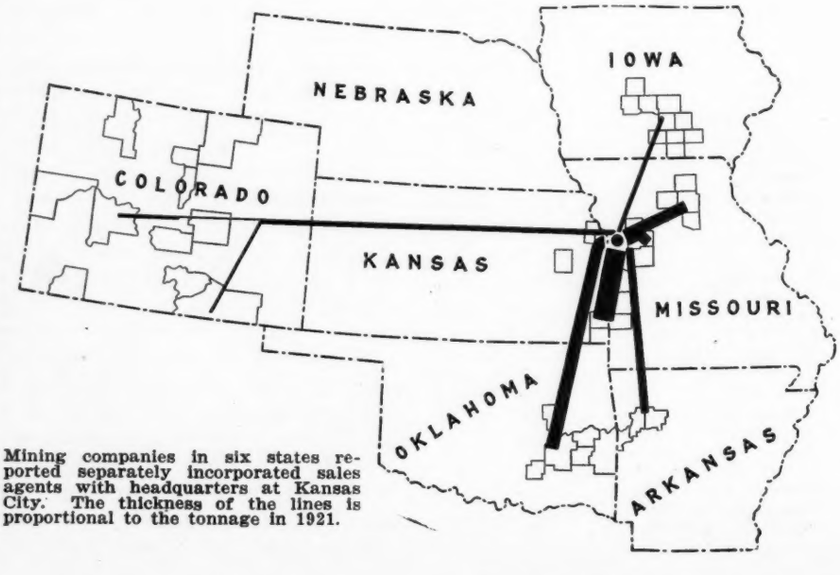
Subject to these qualifications, which are stated for the protection of the reader, the figures give an indication of the quantity moving through sales agent activity and the first picture of the cross relations between the producing districts and sales agency centers.

The twenty-five leading cities in tonnage of soft coal handled by separately incorporated sales agents in 1921 are shown in Fig. 1. Chicago, New York, Pittsburgh, Cleveland, Cincinnati and Philadelphia were the most important.

The figures do not show the total quantities of coal wholesaled through these cities because they do not include the amount sold either by the independent wholesalers or by the selling departments of operating companies. As the reports cover the tonnage handled by only one factor in the wholesale trade, they are undoubtedly less than the total quantity handled at wholesale in each city. Moreover, the effect of crediting the entire tonnage controlled by one sales agent to the city of his main office is to magnify the big centers and minimize the smaller ones. Coal actually sold through a branch office in Baltimore or Louisville, for example, is unavoidably credited to the main offices in Philadelphia or Cincinnati, for the data do not permit of separation.

The location of the principal sales agency centers and the relative importance to tonnage handled in 1921 are indicated in Fig. 2. Most of the tonnage was sold through agents who had their principal offices in cities located within a broad belt, in which 70 per cent of the bituminous output is consumed, extending from St. Louis to New York City. It is this region, north of the Ohio and the Potomac and east of the Mississippi, which includes 66 of our 75 major bituminous-consuming cities, with the

Fig. 3—An Example of Fields Tributary to a Sales Agency Center —Kansas City



Mining companies in six states reported separately incorporated sales agents with headquarters at Kansas City. The thickness of the lines is proportional to the tonnage in 1921.

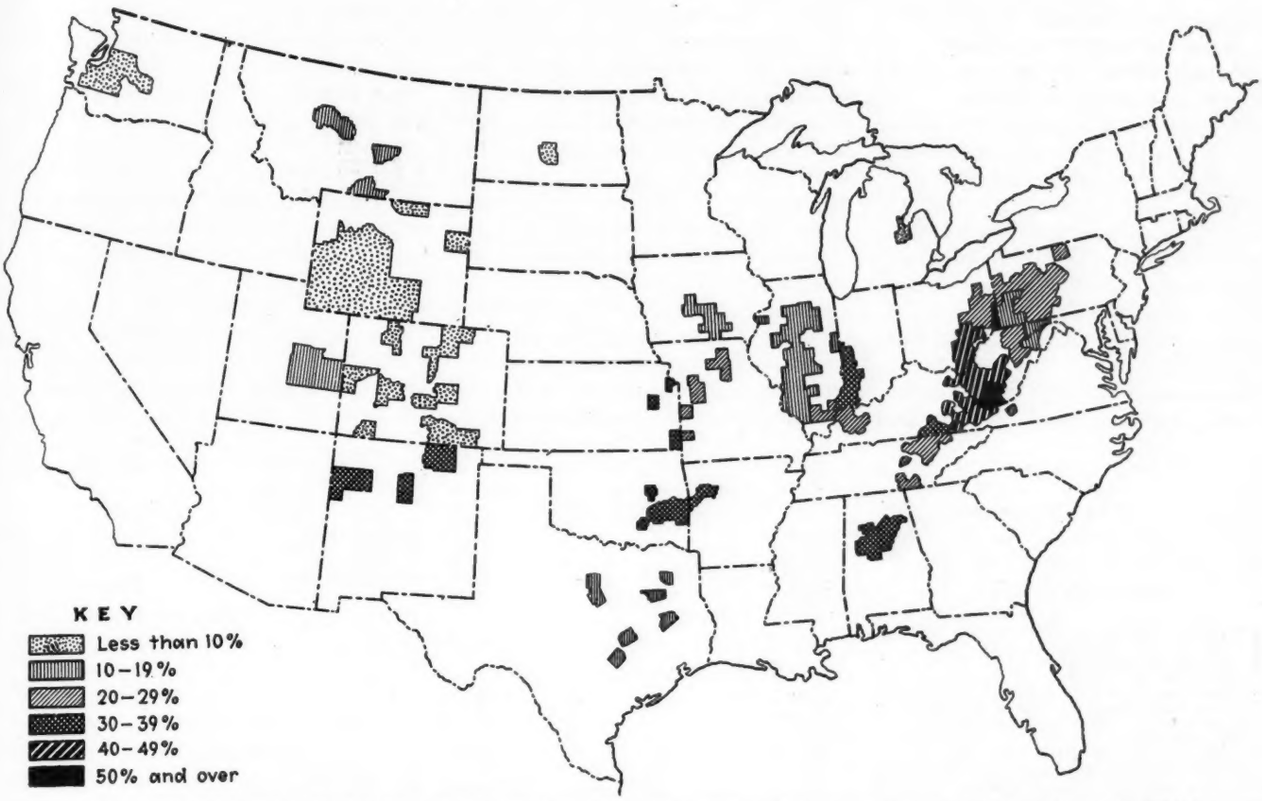


Fig. 4—Per Cent of District Output by Mines Reporting Separately Incorporated Sales Agents in 1921

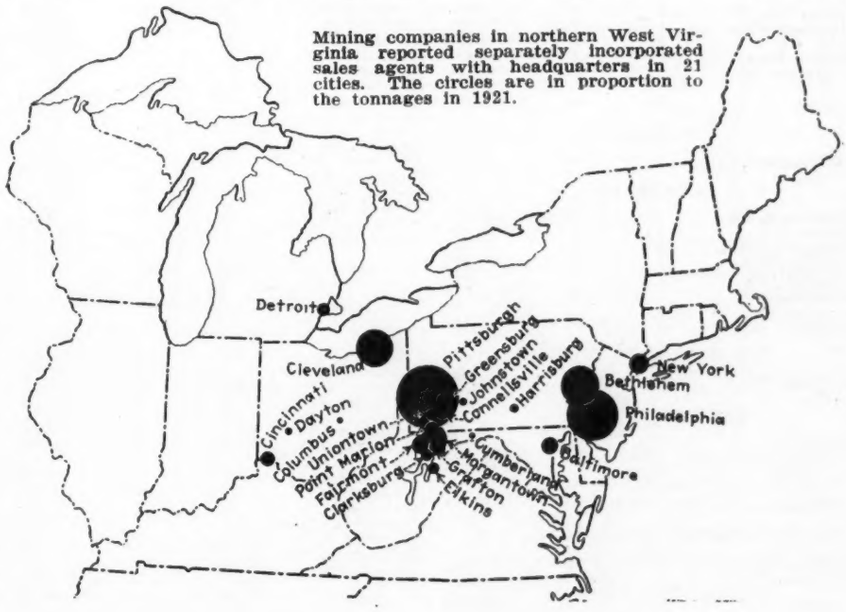
center of power demand for manufacturing (1919) near Marion, Ohio. In this area were six of the most important sales agency centers, which alone handled 50 per cent of the tonnage.

Despite this apparent concentration, there were many other centers, such as Richmond, Knoxville, Spartanburg, Birmingham, Memphis, Kansas City, McAlester and Salt Lake City, serving the rest of the country. In the main, however, the important marketing cities are in or near the principal areas of consumption, which lie north of their sources of supply. This bears out the familiar fact that the big movements of coal are from south to north rather than from north to south.

A CITY seems to become a sales agency center not by accident but because of geographic considerations. Its importance in this respect depends upon a strategic location with regard to transportation facilities between important coal-mining districts and important coal markets. Some advantages of a good location are access to consumers or other wholesalers, good mail connections with the field and the possibility of reconsignment at railroad centers.

There are particular elements in the strength of certain cities as marketing centers. Chicago is one of the largest consumers of coal as well as an immense railroad junction. Cleveland is the heart of the lake trade. Enormous quantities of coal and coke are required to fill the maw of Pittsburgh. Cincinnati, which got an early rise through the traffic down the Ohio River, is the gateway of the principal roads from southern West Virginia to the Middle West. Toledo is the rail outlet to southern Michigan and Canada; Detroit is a large consumer and a portal to the Dominion. New York and Philadelphia are huge consumers and occupy strategic positions in the coastwise movement to New England. Memphis is a railroad center and head of the only bridges over the Mississippi south of its junction with the Ohio. Each of these cities is significant in bituminous coal

Fig. 5—Example of Sales Agency Centers Serving One Producing Field



marketing both because of its relation to important points of consumption and distribution and because of its ready access to the coal fields.

Sales agents in a single city may be entirely supplied by one producing district or they may receive different quantities from a number of districts. For example, Chicago handled coal from seven states and districts; Pittsburgh, with affiliated branch offices, from sixteen, and Terre Haute, Spartanburg and Kittanning from only one district.

How much of the total output is sold by separately incorporated agents? For the country as a whole the proportion in 1921 was 27 per cent. For individual districts the limitations of the data make it unwise to attempt a precise answer, but it may be said that the figures range from less than 10 per cent for Washington, Wyoming, Colorado and North Dakota to 40 per cent or more in southern West Virginia, southern Ohio, northeastern Kentucky and the Panhandle of West Virginia. The unusually large showing for southern Ohio is explained by one very large operating company which sold through an affiliated sales agent at Toledo organized under a separate corporate name. The highest percentage of all was 62 in the low-volatile region of West Virginia. The data are given graphically in Fig. 4.

WHERE the producing field is close to market and where the market is fairly circumscribed, the operator meets a simple problem of distribution by maintaining his own sales office in the nearby center. Under such conditions there is little need for the type of service the sales agent performs. On the other hand, whenever the producing field is a long

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Tonnage of Mines Reporting a Separately Incorporated Sales Agent Classified by Location of Agent's Main Office, 1921

TOTAL output in 1921, as reported to the U. S. Geological Survey, of all producers listed in the *Keystone Coal Catalog* as having a separately incorporated sales agent, arranged according to principal office of agent (Coal sold through branch office of sales agency not shown separately).

It should be remembered that many operators naming sales agents in *Keystone* would not sell their entire output through these agents and that many operators not naming sales agents would sell at times through wholesalers of one type or another. Subject to these qualifications the figures give a rough measure of the tonnage of coal handled by sales agencies separately incorporated from mining companies. Obviously they exclude most of the activities of selling departments of producing corporations and much of the coal handled by independent jobbers.

Location of Sales Companies	No. of Agents	No. of Mining Companies Reporting Connections with Agents in This City	1921 Production of these Companies (Net Tons)
ALABAMA			
Birmingham, Ala.	23	50	3,481,337
Memphis, Tenn.	3	3	342,848
Total	26	53	3,824,185
ARKANSAS			
Kansas City, Mo.	6	9	199,448
McAlester, Okla.	1	9	191,490
Paris, Ark.	2	3	28,352
Wichita, Kans.	1	1	24,080
Clarksville, Ark.	2	8	12,761
Total	12	30	456,131
CALIFORNIA			
San Francisco, Cal.	1	1	12,127
COLORADO			
Walsenburg, Col.	1	4	255,551
Denver, Col.	6	7	246,086
Kansas City, Mo.	1	1	81,605
Amarillo, Texas	1	3	75,593
Trinidad, Col.	1	2	63,682
Florence, Col.	1	1	3,796
Total	11	18	726,313
ILLINOIS—BELLEVILLE			
St. Louis, Mo.	11	19	1,702,363
ILLINOIS—CENTRAL			
Chicago, Ill.	4	6	1,967,620
St. Louis, Mo.	2	2	568,135
Peoria, Ill.	1	1	285,778
Total	7	9	2,821,533
ILLINOIS—SOUTHERN			
Chicago, Ill.	18	28	7,290,143
St. Louis, Mo.	3	3	515,649
Total	21	31	7,805,792
ILLINOIS—OTHER DISTRICTS			
Chicago, Ill.	2	2	428,617
Peoria, Ill.	3	4	291,933
Milwaukee, Wis.	1	1	77,508
Davenport, Iowa	1	2	34,982
Pekin, Ill.	1	1	20,000
Galesburg, Ill.	1	1	15,765
Total	9	11	868,805
INDIANA			
Terre Haute, Ind.	7	17	3,046,466
Indianapolis, Ind.	7	18	2,684,310
Chicago, Ill.	17	24	2,075,454
Dugger, Ind.	1	2	54,665
Other cities	2	2	36,761
Total	34	63	7,897,656
IOWA			
Des Moines, Ia.	2	5	361,354
Mystic, Ia.	1	2	28,987
Kansas City, Mo.	1	1	28,175
Exline, Ia.	1	1	6,172
St. Joseph, Mo.	1	1	5,730
Total	6	10	430,418
KANSAS			
Kansas City, Mo.	9	17	946,960
St. Louis, Mo.	1	1	102,706
Pittsburgh, Kan.	3	3	45,398
Mulberry, Kan.	1	1	18,094
Salina, Kan.	1	1	9,270
Osage City, Kan.	1	2	3,584
Weir, Kan.	1	1	2,943
Total	17	26	1,128,955
KENTUCKY—NORTHEASTERN AND HAZARD			
Cincinnati, Ohio.	27	57	3,342,723
Detroit, Mich.	5	8	517,328
Toledo, Ohio.	3	3	263,020
Lexington, Ky.	3	6	250,944
Chicago, Ill.	3	3	143,426
Huntington, W. Va.	4	9	97,395
Hamilton, Ohio.	1	2	87,994
Ashland, Ky.	5	7	69,528
Knoxville, Tenn.	1	1	57,083
Dayton, Ohio.	1	1	53,316
Louisville, Ky.	1	2	26,710
Lynchburg, Va.	1	1	21,866
Pittsburgh, Pa.	1	1	17,739
Blackey, Ky.	1	1	11,016
Prestonburg, Ky.	1	1	10,511
Columbus, Ohio.	1	1	9,064
Other Cities.	5	5	27,659
Total	64	109	5,007,322
KENTUCKY—SOUTHEASTERN AND HARLAN			
Cincinnati, Ohio.	13	22	954,234
Charleston, W. Va.	1	5	935,985
Knoxville, Tenn.	11	19	676,576
Pittsburgh, Pa.	1	1	283,529
Atlanta, Ga.	2	3	184,368
Middlesboro, Ky.	4	5	155,963
Detroit, Mich.	1	4	146,697
Huntington, Ind.	1	2	53,643
Dayton, Ohio.	1	1	46,489
Pineville, Ky.	3	3	31,504
Harlan, Ky.	1	1	21,413
Chattanooga, Tenn.	3	3	16,532
Louisville, Ky.	3	4	8,853
Birmingham, Ala.	1	1	7,099
Other Cities	1	1	389
Total	47	75	3,523,274
KENTUCKY—WESTERN			
Memphis, Tenn.	4	8	902,714
Birmingham, Ala.	1	4	409,252
Louisville, Ky.	3	4	284,850
Madisonville, Ky.	2	2	172,908
Central City, Ky.	1	1	95,973
Providence, Ky.	2	2	82,200
Nashville, Tenn.	1	1	55,322
Chicago, Ill.	1	1	31,213
Chattanooga, Tenn.	1	1	21,503
Total	16	24	2,055,935
MARYLAND—CUMBERLAND AND PIEDMONT			
Frostburg, Md.	2	3	93,563
New York, N. Y.	1	1	59,849
Pittsburgh, Pa.	1	1	48,238
Cumberland, Md.	4	7	26,511
Philadelphia, Pa.	5	6	25,561
Johnstown, Pa.	1	1	19,593
Bethlehem, Pa.	1	1	15,163
Morgantown, W. Va.	4	4	9,032
Total	19	24	297,510
MISSOURI			
Kansas City, Mo.	8	13	614,706
Pittsburg, Kan.	2	2	110,770
St. Joseph, Mo.	1	1	65,672
Richmond, Mo.	1	1	7,693
Total	12	17	798,841
MONTANA			
Billings, Mont.	2	2	220,329
Great Falls, Mont.	2	4	85,323
Roundup, Mont.	1	1	32,916
Sheridan, Wyo.	1	1	12,495
Total	6	8	351,063
NEW MEXICO			
Dawson, N. M.	1	1	620,000
Gallup, N. M.	1	1	42,718
Total	2	2	662,718
NORTH DAKOTA			
Dickinson, N. D.	1	1	24,280
Mellette, S. D.	1	1	6,798
Total	2	2	31,078
OHIO—NORTHERN AND EASTERN			
Cleveland, Ohio.	19	42	3,609,888
Pittsburgh, Pa.	6	6	786,902
Toledo, Ohio.	1	1	273,215
Wheeling, W. Va.	1	1	79,166
Columbus, Ohio.	2	2	28,089
Canton, Ohio.	2	2	18,602
Other Cities.	1	1	645
Total	32	55	4,796,507
OHIO—SOUTHERN			
Toledo, Ohio.	4	8	2,136,445
Columbus, Ohio.	16	38	743,680
Cleveland, Ohio.	6	7	442,190
Pittsburgh, Pa.	2	2	370,693
Detroit, Mich.	3	3	43,731
Nelsonville, Ohio.	1	1	16,888
Dayton, Ohio.	2	3	15,242
Buffalo, N. Y.	1	1	11,556
Other Cities.	2	2	4,760
Total	37	65	3,785,185

distance from the markets, as is the case in the Middle Appalachian region, there is a demand for the intermediary services of the sales agent. For these latter areas sales through agents account for a large portion of the district output. From this it would seem that geographical differences in the location of the various producing fields determine at least in part the extent to which producers resort to the practice of selling through agents.

The table shows the sales outlets for each district. Producers in a single field may have connections with agents either in a small or in a large number of cities. Space does not permit developing this in detail, but a few examples will serve as illustrations. The output from Belleville, Ill., marketed through agents is handled entirely in St. Louis, from New Mexico in Dawson and Gallup, from Utah in Salt Lake City, from Alabama in Birmingham and Memphis and from Texas in Dallas, Fort Worth and Rockdale.

On the other hand, coals from most districts in Pennsylvania, Kentucky and West Virginia are handled by agents in a large number of cities over a relatively wide distributing area.

No complete survey was made of the types of mining companies which used sales agents. An examination of the tabulations, however, revealed that with a number of very important exceptions they were small producers in the main. The exceptionally large companies, moreover, were often financially affiliated with their agents. It appears that lack of output sufficient to maintain an adequate selling organization and great distance from market are the chief reasons impelling a producer to form connections with a sales agency.

Location of Sales Companies	No. of Agents	No. of Mining Companies Reporting Connections with Agents in This City	1921 Production of these Companies (Net Tons)
OKLAHOMA			
McAlester, Okla.	3	22	636,286
Kansas City, Mo.	3	3	515,942
Henryetta, Okla.	2	3	38,907
Oklahoma City	1	1	26,188
Fort Smith, Ark.	1	2	20,543
Total	10	31	1,237,866
PENNSYLVANIA—PITTSBURGH AND FREEPORT			
Pittsburgh, Pa.	21	29	3,359,393
Cleveland, O.	3	4	1,148,878
Greensburg, Pa.	1	1	146,520
Philadelphia, Pa.	1	1	45,834
Connellsville, Pa.	1	2	20,717
Wheeling, W. Va.	1	1	9,091
Total	28	38	4,730,433
PENNSYLVANIA-CONNELLSVILLE			
Pittsburgh, Pa.	11	19	1,688,987
Uniontown, Pa.	11	19	414,919
Greensburg, Pa.	2	2	197,672
Connellsville, Pa.	5	13	124,436
Leetonia, O.	1	2	124,282
Morgantown, W. Va.	3	4	51,124
Philadelphia, Pa.	1	1	10,070
Pardus, Pa.	1	1	4,704
Brownsville, Pa.	1	1	2,226
Total	36	62	2,618,420
PENNSYLVANIA—WESTMORELAND			
Pittsburgh, Pa.	9	9	1,641,679
Greensburg, Pa.	3	6	443,133
Philadelphia, Pa.	1	2	410,588
Ligonier, Pa.	2	3	288,634
Latrobe, Pa.	1	3	205,913
Cincinnati, O.	1	1	87,150
Johnstown, Pa.	1	1	5,228
Portage, Pa.	1	1	4,363
Connellsville, Pa.	1	1	2,758
Total	20	27	3,089,446
PENNSYLVANIA—OTHER DISTRICTS			
New York, N. Y.	22	38	3,783,293
Philadelphia, Pa.	39	53	3,206,415
Rochester, N. Y.	2	7	1,926,330
Kittanning, Pa.	2	5	789,238
Boston, Mass.	7	14	511,557
Johnstown, Pa.	6	12	536,916
Pittsburgh, Pa.	12	19	472,847
Cleveland, O.	2	2	226,639
Buffalo, N. Y.	7	7	225,718
Bethlehem, Pa.	1	2	172,071
Worcester, Mass.	1	1	168,974
Wheeling, W. Va.	1	1	154,911
Patton, Pa.	1	2	82,386
Blairsville, Pa.	1	1	74,152
Clearfield, Pa.	2	3	72,045
Clarion, Pa.	2	4	68,991
St. Marys, Pa.	3	6	62,504
Syracuse, N. Y.	1	1	47,097
Coalport, Pa.	1	1	41,730
Hastings, Pa.	1	3	36,618
Punxsutawney, Pa.	4	5	29,055
Madera, Pa.	2	2	23,505
Hartford, Conn.	1	1	18,488
Brockwayville, Pa.	1	2	14,960
Altoona, Pa.	4	5	11,785
Connellsville, Pa.	1	2	3,040
Stoneboro, Pa.	1	1	2,959
Sarton, Pa.	1	1	23,727
Meyersdale, Pa.	1	1	91,069
Baltimore, Md.	3	3	36,754
Somerset, Pa.	3	3	10,664
Cumberland, Md.	1	1	350
Others	5	5	17,801
Total	142	214	12,944,589
TENNESSEE			
Knoxville, Tenn.	10	10	493,364
Cincinnati, O.	2	2	139,726
Birmingham, Ala.	1	1	114,786
Chattanooga, Tenn.	3	5	89,030
Harriman, Tenn.	1	1	76,448
Bohm, Ala.	1	1	49,401
LaFollette, Ala.	1	1	8,966
Others	3	3	2,183
Total	22	24	973,904
TEXAS			
Dallas, Texas	2	3	61,536
Forth Worth, Texas	2	2	58,464
Rockdale, Texas	1	3	43,931
Total	5	8	163,931
UTAH			
Salt Lake City	3	3	602,690
VIRGINIA—EXCLUDING POCAHONTAS			
Spartanburg, S. C.	1	1	1,822,412
Knoxville, Tenn.	1	7	253,122
Tazewell, Va.	1	5	142,113
Bluefield, W. Va.	1	5	113,587
Roanoke, Va.	2	2	111,456
Cincinnati, O.	3	3	97,303
Johnson City, Tenn.	1	1	96,216
Beckley, W. Va.	1	1	63,687
Columbus, O.	1	1	26,400
Tacoma, Va.	1	1	26,000
Raven, Va.	1	1	25,742
Norton, Va.	1	2	17,363
Richlands, Va.	1	1	17,239
Big Stone, Va.	2	2	11,200
Others	2	2	10,175
Total	20	35	2,834,015
WASHINGTON			
Seattle, Wash.	1	1	43,652
Portland, Ore.	1	1	9,314
Total	2	2	52,966
WEST VIRGINIA—SOUTHERN, HIGH VOLATILE[a]			
Huntington, W. Va.	15	40	1,623,771
Cleveland, O.	3	5	1,590,561
Charleston, W. Va.	17	44	1,529,581
Cincinnati, O.	18	32	1,354,235
Columbus, O.	6	9	899,360
Fairmont, W. Va.	1	3	740,678
Lundale, W. Va.	1	4	722,201
Detroit, Mich.	4	6	363,301
Welch, W. Va.	1	2	183,769
Covington, Ky.	1	1	110,330
Toledo, O.	4	5	103,700
Mt. Hope, W. Va.	1	1	88,229
Dayton, O.	2	2	87,329
Omar, W. Va.	2	3	87,123
Bluefield, W. Va.	2	2	83,438
Boston, Mass.	1	1	77,726
Lynchburg, Va.	2	4	74,908
New York, N. Y.	1	1	53,690
Powhatan, W. Va.	1	1	50,012
Philadelphia, Pa.	2	2	39,590
Kistler, W. Va.	1	1	34,814
Williamson, W. Va.	4	4	34,445
Roanoke, Va.	1	1	30,479
Pittsburgh, Pa.	2	2	25,751
Beckley, W. Va.	1	1	14,787
Greensburg, Pa.	1	1	11,872
Others	5	5	11,907
Total	100	183	10,027,587
WEST VIRGINIA—SOUTHERN. LOW VOLATILE[b]			
New York, N. Y.	9	26	6,660,031
Philadelphia, Pa.	4	8	2,050,658
Bluefield, W. Va.	5	20	1,934,759
Cincinnati, O.	9	22	1,650,360
Charleston, W. Va.	6	12	1,527,428
Boston, Mass.	3	12	857,739
Beckley, W. Va.	3	15	702,115
Huntington, W. Va.	3	6	383,989
Richmond, Va.	2	6	360,973
Columbus, O.	2	6	332,473
Mt. Hope, W. Va.	1	3	318,490
Chicago, Ill.	3	7	274,170
Detroit, Mich.	2	4	262,673
Norfolk, Va.	3	4	191,113
Dayton, O.	1	1	150,358
Indianapolis, Ind.	1	1	88,495
Lundale, W. Va.	1	1	66,817
Welch, W. Va.	3	3	54,263
Cleveland, O.	1	1	45,972
Milwaukee, Wis.	1	1	33,006
Newport News, Va.	1	1	21,730
Pittsburgh, Pa.	1	1	17,358
Lynchburg, Pa.	1	1	10,869
Total	66	162	17,995,839
WEST VIRGINIA—NORTHERN[c]			
Pittsburgh, Pa.	15	23	1,267,629
Philadelphia, Pa.	16	24	844,570
Cleveland, O.	3	4	541,161
Bethlehem, Pa.	2	3	488,861
Morgantown, W. Va.	7	15	399,280
New York, N. Y.	5	7	167 110
Baltimore, Md.	1	2	97,616
Fairmont, W. Va.	8	9	82,104
Greensburg, Pa.	2	4	48,956
Point Marion, Pa.	1	1	47,295
Connellsville, Pa.	1	2	47,157
Clarksburg, W. Va.	4	14	46,580
Uniontown, Pa.	5	5	42,879
Cincinnati, O.	1	1	40,730
Elkins, W. Va.	1	3	37,082
Detroit, Mich.	1	1	31,788
Grafton, W. Va.	2	2	29,613
Harrisburg, Pa.	1	1	21,340
Dayton, O.	1	1	20,000
Johnstown, Pa.	1	1	16,822
Columbus, O.	1	2	4,690
Cumberland, Md.	2	2	525
Others	2	4	8,967
Total	83	131	4,272,755
WEST VIRGINIA—PANHANDLE			
Cleveland, O.	3	3	1,898,291
Pittsburgh, Pa.	2	3	130,706
Wheeling, W. Va.	1	1	9,000
Leetonia, O.	1	1	2,612
Total	7	8	2,040,609
WYOMING			
Salt Lake City	1	1	6,235
Total	661(*d*)	1,581	112,574,996

(*a*) Includes Kentucky portion of Williamson (Kenova-Thacker) field.
(*b*) Includes Virginia portion of Pocahontas field.
(*c*) Excludes Grant, Mineral and Tucker counties, for which see Maryland—Cumberland-Piedmont.
(*d*) This total eliminates duplication which arises when an agent serves more than one field.

CERTAIN QUESTIONS

That BENJAMIN FRANKLIN *Might Have Asked*

By Eugene McAuliffe
President, Union Pacific Coal Co.

> *"While I was intent on improving my language I met with an English grammar having at the end of it two little sketches on the arts of rhetoric and logic, the latter finishing with a dispute in the Socratic method; and soon after I procured Xenophon's 'Memorable Things of Socrates,' wherein there are many examples of the same method. I was charmed by it, adopted it, dropped my abrupt contradictions and positive argumentation and put on the humble inquirer."*
>
> —BENJAMIN FRANKLIN.

WE must confess the futility of writing prescriptions for the bituminous coal industry, for, as we have said before, commissions—local, state and national—have investigated its intricacies; economists have weighed, measured and calibrated its vagaries, and reformers of both sexes have prescribed for it. Yet it blunders along in quite the same old way; so why not divide the responsibility of finding a solution for the industry's troubles by employing the Socratian method of asking qustions, letting, however, each interested individual provide his own answer; and so we inquire:

Is it true that men prominent in the bituminous coal industry, such as Mark Hanna, Colonel W. P. Rend, Horace L. Chapman and Colonel A. L. Sweet, all now dead, plus a few who are yet living, urged the conclusion of the first joint interstate agreement, signed in Columbus, Ohio, in February, 1886, in order to save the industry from itself?

Is it true that competition between coal producers, intensified by the ability to change wage scales and freight tariffs overnight, continuously drove the industry toward bankruptcy forty years ago, the demand for lower costs and consequent lower wage rates, made by one company, "gone one better" by its competitors, until the irreducible minimum was reached, and was the strife for business between railroads such that midnight-made tariffs cut their revenues until they too were unable either to give service or pay their wage and material bills?

Is there any truth in the old saying that "history repeats itself," and is there any relation to be found between the present Colorado bituminous coal and lignite situation, and that referred to above as existing forty years ago?

Is there any importance to be attached to the statements attributed to the President of the United States; the Secretary of Labor; Charles M. Schwab, president of the American Iron and Steel Institute, and others, to the effect that the existing extraordinary prosperity the nation is now enjoying, far exceeding that of any other country, is due to the substantial buying power of the wage earners, and is there any general nation-wide demand for wage reductions?

WILL the industry, by establishing a condition whereby the principle of "self determination" in wage rate making is made possible, establish a cost relation situation whereby each producer will be able to sell his output at a profit?

Would sweeping reductions in coal freight rates make it possible for each producer to sell his output at a profit, and will any adjustment in transportation rates between the various producing and consuming districts create a demand for additional coal?

Was the so-called "Jacksonville scale" actually made at the Jacksonville (Fla.) meeting held in the spring of 1924, or was the action taken at Jacksonville merely the second extension, without change, of the agreement originally signed at Cleveland in August, 1922, which included the basic rates (other than day rates) fixed by the United States Bituminous Coal Commission and which averaged about 27 per cent above the war-time scale fixed by the United States Fuel Administrator, together with the advance in day rates won by the district strikes of 1920?

Was the demand for increases in day wages made by the miners' union and secured by district strikes in 1920 the result of certain operators deviating upward from the day wage scale then in force, beginning with the covert payment of unearned overtime to day men, followed by the buying on the part of certain operators of their neighbors' motormen, drivers, trackmen, timbermen, electricians, etc.; and was not the present scale made at Cleveland in August, 1922, next reaffirmed and extended at the Chicago meeting of the Central Competitive Field operators held in January, 1923, and the Jacksonville agreement a second extension made in 1924 to expire March 31, 1927? If such is the record, why is so much stress laid on the Jacksonville extension, with no word of criticism for the action taken at Cleveland in 1922 and in Chicago in 1923?

Is it true that the per capita demand for coal has decreased as a result of the more efficient methods employed in creating power, including the use of oil for steam making and in internal-combustion engines, and the sweeping extension in the use of electricity generated in central

power and hydro-electric plants, and will there, as many affect to believe, be a further reduction shown in unit consumption of coal?

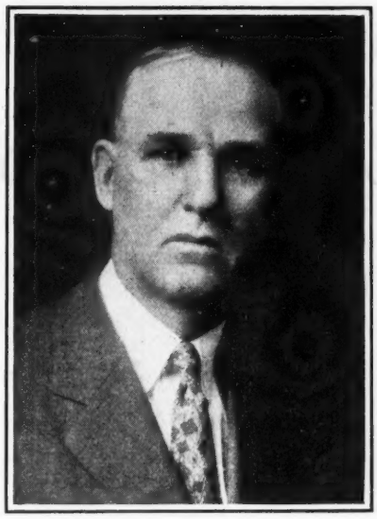
HAS the industry too many men and too many mines, and if so must this condition continue, reducing the "standard of living" for both mine capital and mine labor, just as China's overcrowded condition—245 persons to the square mile, compared with 36 per square mile in the United States—makes for lower living standards in China than obtain here, and if so, can a reduction of mines and man power be made through a selective process, affording a living opportunity for those which remain?

Could such a selective process be obtained without legislative enactment and by the adoption of methods akin to those made use of in the successful manufacturing industries, as, for example, the substitution of mechanical loaders for hand loading, with a resultant concentration of the working area and an increased output per man shift worked on the part of the certain producers whose mines are best adapted to mechanization and who are in a position to obtain capital with which to install additional facilities?

Would the further mechanization of coal mines contribute to the conservation of coal reserves, and would such reduce the accident rate, now approximating 100 fatalities per 1,000 three-hundred day workers, a high ratio when compared with the 21.8 lost in the mines of Great Britain, France and Belgium, using the same basis of exposure?

WOULD a shift on the part of the coal producers from the study and consideration of such transient and fragmentary remedies as mild aperients, temporary sedatives and local embrocations to the theory of an exhaustive study and frank recognition of the real underlying situation that surrounds the industry be more permanently helpful, and would such study develop disabilities wider and more inclusive than the mere question of competitive wage rates?

Would the collection by an authoritative and disinterested branch of the federal government, with prompt and recurring publication of all the facts that surround the cost of producing coal, including the return on capital received, the total unit cost of production and realization, together with the daily, monthly and annual wages earned by the various classes of workers, the opportunity for employment available and that made use of, be helpful to operators in determining the price that should be asked for their product?



Eugene McAuliffe

Would a real effort toward cooperation between the mine operators, who represent the capital invested in the industry; the mine workers, who labor to produce the coal; and the consumers, who pay for it, effect even a partial tranquilization of the industry, with resultant benefit to all concerned?

Would it help if the operators publicly, as they frequently do privately, admit that the rank and file of mine workers would prefer a more dependable form of employment and that their right to a fair wage return and to fair treatment is just as important to them and their families as it is to the employer that he prosper, and are any of the vagaries shown by mine workers at too frequent intervals the outcome of past indifferent treatment accorded them?

Would it help if the United Mine Workers took solemn cognizance of the fact that the doctrine of *force-majeure* is a thing of the past, and that the numerous and sweeping injunctions recently issued against striking mine labor represents merely the lawful putting into active effect of the nation-wide feeling that property should be taken and held only by lawful process, and that murder and assault, while quite common, are as yet generally expressed through individual rather than mass action; and would a court injunction, if properly obeyed, have saved the six lives lost at the Columbine (Colo.) mine on Nov. 21 last?

WOULD it tend to strengthen the influence of the mine worker's organization if less politics, including that shown by the intemperate efforts of many "outs" to become "ins," became the rule, and a few dependable representatives could, unmolested, weigh each important situation carefully and impartially, thereafter moving toward remedial methods instead of being continuously attacked and harassed by individuals within the organization who shout radical theories for the sole purpose of gaining office, assuming the charge to be true?

Would it be helpful to the industry in promoting a better work-time year if the larger consumers, including the railroads and other public utilities, would store a substantial amount of coal during the off-demand period, the wage scales and coal freight rates to be arranged so as to provide an incentive for off-peak period buying through nominal seasonal reductions, which should be returned by providing similar seasonal increases during the heavy buying period, the coal so stored to be taken up and used when the seasonal demand is greatest; and would such arrangement help to tranquilize and regularize the industry and the labor employed therein?

In conclusion, is it irrelevant to ask whither the present situation is leading; is it ultimately to end in widely scattered and recurring strikes, such as took a tremendous toll from all industry in 1918 and 1922, with possible new and far-reaching losses expressed in the destruction of life and property, followed by the ultimate passage of repressive legislation; or will those involved in the present situation make serious effort toward betterment, such as was successfully worked out by the railroads after their return to private management March 1, 1920? If so, is the job not one that should command, and at once, the earnest thought and attention of all parties at interest—producers, workers and consumers?

It will be remembered that Socrates was merely a "humble inquirer," leaving the task of finding the answers to his questions to others.

Interstate Joint Commission

Justifies Collective Bargaining

In Southwestern Coal District

By Sydney A. Hale
Managing Editor, Coal Age

BETWEEN April 1, 1916, and Dec. 31, 1921, there were 1,873 strikes in the coal fields of Kansas. If a balance sheet had been set up for the miners at the end of this period, it would have shown losses in wages of $10,552,757—and as an offset of $852.83! Of this latter sum $765 covered an adjustment in the price of fuse and dynamite already under way when the suspension which made this an issue was started by union officials.

The effect of this turmoil upon the operators of the Southwest was expressed in their statement to the United States Coal Commission in June, 1923, when the Southwestern Interstate Coal Operators' Association said:

"The policy and practices of the United Mine Workers of America have become insuperable obstacles to the efficient and regular production of coal in the Southwest. This policy has involved wholesale violation of contract, interference with the legitimate functions of management, maintenance of an exorbitantly high wage scale, resistance to the introduction of labor-saving machinery and safety devices, and the use of intimidation and violence to prevent any operator or worker from mining coal except under the domination of this labor monopoly."

The Southwest was heartily sick of the union, its policies and its records, and many coal operators in Arkansas and Oklahoma seized the first favorable opportunity which presented itself to turn to open-shop mining. But today in those parts of the Southwestern coal field that still recognize the United Mine Workers there is no complaint that labor is treading upon the toes of management, no cry that mine management is denied the right to discipline written into the terms of the interstate and district agreements. There is, to be sure, dissent to the wage policies of the union both with respect to the basic rates and to the manner in which such rates are fixed. That, however, is another story.

Kansas, for years a storm center and an unfailing source of news of labor disputes and strikes, has almost disappeared from the pages of the chronicles of industrial warfare. Since April 1, 1924, coal strikes have been so few in that section of the country that the record is no longer worth keeping. Peaceful relations have taken the place of continuous strife.

What is the answer to this radical change in the labor situation in the Sunflower State? The answer is to be found in the Joint Interstate Commission created by the 1924 contract and continued with undiminished authority by the agreement signed at Kansas City, Mo., last October. The provision establishing this body read:

"All cases that are disagreed upon by the various joint boards shall be referred, together with the records in such cases, to a commission consisting of Mr. John P. White and Mr. W. L. A. Johnson for final settlement."

BY THIS provision the White-Johnson commission became the last word in contract interpretation in the districts comprising the Southwestern interstate field and the international executive board of the union practically faded out of the picture. The subordinate procedure for handling disputes remained unchanged until the new agreement signed last fall at Kansas City following the Illinois wage truce of Oct. 1.

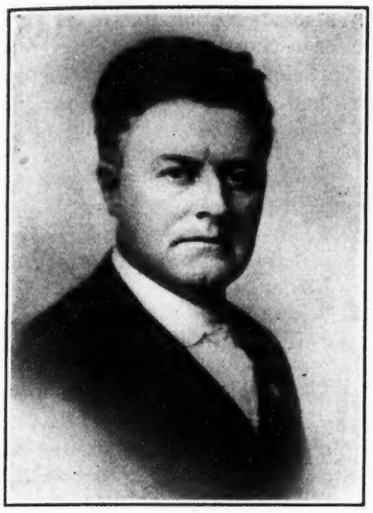
In the first instance a grievance was a question for settlement by the mine foreman and the worker who felt he had a just cause for complaint. If these two failed to reach an amicable understanding the dispute was taken up by the foreman and the pit committee. The next step was to refer the dispute to the mine superintendent and the district president of the union or his representative. If that step failed the case was then taken up by the district president and the operators' commissioner and next by the district joint board.

IN the October, 1927, contract, this procedure was modified by the elimination of the joint board as a body handling these grievances.

The commission was authorized to establish its own rules of procedure. The members of this board insisted that all cases be submitted to it in writing. "All cases shall be accompanied by the records in such cases, which shall consist of the signed joint statement [of the grievance], the written evidence in the case and a brief in such case. The commission will call for such additional evidence as it may mutually request. Personal and oral presentation of cases by representatives of each side will be allowed only when mutually agreed to by the commission."

In actual practice, oral presentation is the exception. The arguments, or briefs, prepared by the spokesmen for the disputants are not considered as evidence, but are treated in the same light as arguments of counsel in the courts. At the outset there was some demand that the commission turn its sessions into open hearings, but the commission resisted this pressure, insisting that its decisions must be based upon the written claims and evidence presented before the subordinate tribunals. By taking this stand the commission made it impossible for either party to shift its basis of attack or defense from that brought forward when the dispute originated.

Whenever possible, the commission prefers to have the case submitted on an agreed statement of facts with each side citing contract, custom and previous decisions to support the interpretation each side places upon those facts. Where an agreed statement cannot be made because the facts themselves are in dispute, the



John P. White

commission's submission form blank calls for what amounts to a certification by the signatories of the conflicting statements as to the actual facts involved in the dispute.

As a natural corollary to its refusal to hear testimony the commission also has declined to visit the mines where disputes arise for the purpose of examining the working places or interviewing the pit committeemen. To make such visits would, the commission felt, take up too much of its time and defeat the underlying purpose of its labors as a court of last resort. If it deems the evidence submitted incomplete, it can, and has at times so done, send the case back to the lower tribunals for further investigation and report.

THE commission has been insistent that the provisions and the spirit of the contract between the operators and the union should be given full force and effect. It has acted consistently on the theory that the language and the intent of the agreement were fair to both parties and has been ruthless in sweeping away customs and conditions which have been permitted to violate the contract provisions. The operator who has taken advantage of necessity or technicalities finds as little comfort in the decisions of Messrs. White and Johnson as the district and local politicians who have encouraged their followers to demand concessions not contemplated by the framers of the agreement.

One of the first problems which the commission had to face was how it was to deal with the practice of local unions in establishing lists for employment. This practice had grown to such an extent that the 1924 contract specifically provided that "no list shall be kept for the purpose of regulating the employment of applicants" and "no rule shall be enforced or enacted in conflict with the provisions of this paragraph."

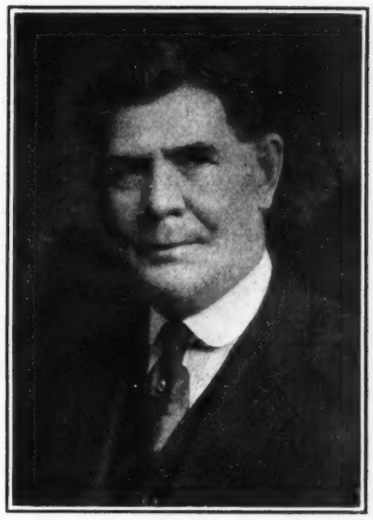
Nevertheless the second decision of the commission turned upon this very question. The case involved the claim of a man demanding employment as a miner and compensation for time lost. The evidence showed that the local union was maintaining a list of applicants, but that the operator refused to recognize that list. In denying the claim the commission cited the provisions of the contract reading:

"The management of the mine, the direction of the working force, and the right to hire and discharge are vested exclusively in the operator, and the U. M. W. of A. shall not abridge these rights. * * * No member of the United Mine Workers shall be denied employment except for sufficient cause, other than personal prejudice or activity in matters affecting the U. M. W. of A."

FAILING to find evidence of personal prejudice or discrimination, the commission dismissed the appeal. This decision, however, did not stop the flood of cases involving the same question. Less than a month later the commission again made plain its determination to enforce the provisions of the contract when it upheld the discharge of a pit committeeman who told a miner that "there were five men ahead of him on the list and added: 'you know what that means'."

Then tempering justice with mercy, the commissioners concluded "on account of this case being among the first under the new contract coming to the commission, that we are inclined to recommend leniency as to this committeeman (this rule of leniency will not be the commission's rule in the future, however), and, therefore, in this case direct that he be re-employed as a miner, but that he be and is hereby disposed as a mine committeeman during the remainder of this contract."

Another angle of the right of men to demand employment came up in cases in which old miners insisted upon preference. The right of management to select those men for entry work whom it deemed most competent has been upheld. Fines assessed by local unions against men who accepted work ahead of a certain applicant were roundly con-



W. L. A. Johnson

demned in another decision and it was held to be the duty of the district officers to break up such practices. On the other hand where there was a specific agreement to give an applicant work the commission sustained the claim for compensation for time lost when another was employed.

In the case of a groundman who was discharged for refusing to leave his regular work to take up some water line when ordered to do so by the foreman while a part of the force was rerailing a wreck on the dinkey track, the commission held that the discharge was justified under the provisions of the contract requiring all company men to "perform whatever labor the foreman shall direct." Discharge for incompetency also has been sustained in a number of cases coming before the commission. Persistent loading of dirty coal has been recognized as a justification for discharge.

DAY and monthly men who have acted on the theory that they could not be required to work full time when the specific task at which they are ordinarily employed can be finished in less than eight hours have been undeceived. A gas man whose run was finished in four hours discovered that his boast that he would quit his job before he would work a full eight hours was accepted at its face value. When he made a claim for reinstatement he was informed that he had forfeited his rights as an employee.

In the case of a loader who quit at noon in defiance of instructions and thereby prevented a conveyor crew from loading out all its coal that day, the commission turned down the

claim for reinstatement and compensation. The company, the decision pointed out, had the right to demand a full day. "In order that the greatest possible efficiency and economy could be brought to bear upon the operation of the loading machines and the work of the crew, it was necessary that the day's work be completed to avoid loss not only to the company but to the rest of the crew."

Yet, despite this situation, the claimant "sought to inforce his own will and pleasure in the matter of laying off in the face of the refusal of the foreman to give permission. The commission feels that such action can only be construed as insubordination and a refusal to recognize the right of the management to have the proper direction of the working force."

In a number of cases demands for reinstatement have been made by workers who claimed compensation for permanent or partial disability under the workmen's compensation law. The commission after passing upon this question a number of times thus summarized its views:

"The commission has definitely laid down the principle that the company is entitled under the contract to select average able-bodied men, whether they be day men or miners. If they be day men, the national standard day-wage contract entitles the company to the selection of average able-bodied men; if they be miners or piece-workers, the company is enentitled to the selection of average able-bodied men by reason of the fact that in the investment and equipment of a coal mine a vast expenditure is necessary to sink mines, provide machinery and equipment, and drive entries and roadways in order to provide sufficient development to produce a proper tonnage per day commensurate with the investment. Thus the maintenance of a certain number of rooms sufficient to produce a certain tonnage entitled the company to have that tonnage produced each day. The failure of an average able-bodied miner to produce his proper tonnage subjects the company to a loss that is violative of the economic standard of good business management and against the proper enforcement of scientific mining practices."

The idea that the operator is entitled to efficiency also is stressed in other cases in which the question of injuries is not involved. For example, the transfer of a loader on a conveyor crew to other employment was upheld when the evidence disclosed that it was necessary to help out the claimant daily in order that the face might be cleaned up and the conveyor reset with all miners performing an average day's work. The principle of efficiency also has been recognized in cases involving a reduction of working forces at the mines.

The commission, as stated in an earlier paragraph, has been equally vigilant in protecting the rights of the miner. The attempt of an operating company to compel all employees to become stockholders in the mine was answered by a decision upholding a demand for reinstatement and compensation by workers who did not invest. A technical defense for failure to pay proper compensation for deficiency work makes no impression upon Messrs. White and Johnson. Employment of a man needing work badly at boy's rates, even when the employee accepted the lower scale, has been condemned as subversive to the principles of the contract between the union and the operators.

> "IN SO FAR as the management of the mine is concerned the contract gives the company the right to exercise its best judgment in the operation of the mine along the lines of scientific management, direction of the working force. In view of the fact that the investment of capital in the mining industry is based wholly upon the necessity for operation at a profit, it naturally follows that the rightful and proper economy in accordance with the judgment of the company is embraced in the underlying principle of the agreement [giving management the direction of the working force and the right to hire and discharge]. The commission therefore holds that the company was within its rights in a reduction of forces in the interest of economy."

THE Joint Interstate Commission has been in existence over three years. In that time it has handled cases covering almost every grievance, real and fancied, which disgruntled workers or ingenious labor officials could think up. At the outset it inherited a large volume of unsettled grievances over which joint district boards had been deadlocked for months. During the early days of its existence it was handling complaints at the rate of 26 a month; in recent months the average has dropped to 7. Decisions generally are reached within a week after submission.

Its early days were not pleasant. Local union politicians viewed it with disfavor because it threatened their political power and prestige. There was a disposition, apparently, to make it a dumping ground for all manner of grievances. If those opposed or lukewarm to its creation hoped to embarrass it by loading it down with difficult problems, their hopes were blasted. Possibly the best evidence of the position held by the Joint Interstate Commission is the fact that its continuance and the incorporation of its findings into the industrial code of the Southwest was the first consideration in the 1927 joint negotiations.

The commission has taken nothing from the miners to which the workers were entitled under the contract. On the other hand, the existence of the commission perhaps more than anything else is responsible for the renewal of a union agreement in Kansas. Moreover, in the Southwest at least, it has demonstrated that a commission without an umpire can avoid the deadlocks which are always urged as the fundamental objection to a board which has no odd member to cast the deciding vote.

Personnel and freedom from political influence also play a part in the success of this form of conciliation. Both members of the commission are veterans in the labor movement. By being named specifically in the contract their tenure of office is assured and no suspicion of motives can intrude.

Finally, it is no exaggeration to say that the work of the Joint Interstate Commission has restored a waning faith in the principles and integrity of collective bargaining in the coal fields of Kansas.

ANTHRACITE
Hitting Its Stride In Market Battle

AN INTERVIEW WITH

A. J. Maloney

President,
Philadelphia & Reading Coal & Iron Co.

A. J. Maloney

"DO I believe in the future of the anthracite industry?" The new chief executive of the Philadelphia & Reading Coal & Iron Company, who left the Illinois bituminous field last fall to assume active management of the largest corporation in the hard-coal region, repeated the question asked by the interviewer. "The fact that I'm here in Philadelphia answers that question."

"I thought as much," admitted the interviewer. "But as it has been the fashion lately to hang crêpe upon the industry and polish up obituary notices we felt that your viewpoint, coming in as you do fresh from another branch of the coal industry, would be particularly illuminating."

"If any European nation had the anthracite resources lying in northeastern Pennsylvania," continued Mr. Maloney, "neighboring countries would be ready to go to war with it to wrest the precious heritage from it —and the proud possessor of that birthright in hard coal would fight desperately to retain control. Nobody here is trying to take the anthracite properties away from us. All we are called upon to do is to hold our own against the competitors who have been creeping into our markets.

"Whether we have been asleep or not in allowing that penetration, whether under the peculiar conditions which prevailed we could have stopped the inroads are questions about which we need not waste any time now. The job today is not lamenting over past mistakes or errors of omission but to regain lost ground and to build our markets for the future.

"Nobody every got fat crying over spilt milk. This industry is not going to make any headway sitting down thinking of the good old days before the war. Those good old days are gone—just as they have vanished in every other line of business. It's a grand and bitter fight between competing companies in the same line and competing commodities for the share of the consumer's dollar.

"We're in no worse position in this respect than other enterprises. What if oil, gas, coke and other forms of heat are striving to get into the picture? You can match that situation in almost every other line. Cedar shingles are fighting asbestos, substitutes are battling with lumber, the movie has played hob with the stage and the radio has given the talking machine people something to think about. But those who expect to be in business next year and ten or twenty years from now are not satisfied with complaining; they're too busy doing, working to get back into their stride.

"Our first endeavor is to reduce our production costs by the application of the safest and most efficient mining methods which can be devised.

"Next we must prepare our product in such a way as to win the greatest possible consumer acceptance.

"In other words, we must apply to the conduct of this greatest industry the principles of modern merchandising of product and efficient production which have won outstanding success for the leaders in other industrial enterprises."

AS TO the individual plans of the company which he heads, Mr. Maloney was silent. He preferred, he indicated, to let the results so far as his particular organization efforts were concerned, speak for themselves.

He did make it plain, however, that nothing which promised improvement in the production and merchandising processes of the industry would be ignored. "We must freely acknowledge," he said, "that the consumer is king in distribution today. The day of the high hat has passed. While the customer may not always be right, he must be pleased and, so far as humanly possible, we must serve him in a manner which will assure us continued patronage and support.

"These are fundamentals in the conduct of modern business which the anthracite industry must recognize if it expects to survive—and I certainly expect that this great industry will survive and enjoy a prosperous future. There is nothing mysterious about these principles or about the anthracite industry, but the successful application of these fundamentals to any business means a lot of hard work. That is the only magic which we who are laboring in the hard-coal field can hope to use."

How the MANUFACTURER *Can Help the* COAL PRODUCER

HOW CAN the manufacturer of mining equipment best co-operate with the coal operator to improve the technical processes and the financial position of the coal industry in 1928? This was the question put to a small group of manufacturers of mining machinery and allied lines by *Coal Age*. The replies received to this question from the executives of these companies are summarized below.

Several of the manufacturers addressed believe that the greatest co-operation which they can offer is through their highly specialized sales-engineering staffs. These sales-engineers, they point out, are in a position to advise intelligently with the operator on how to reduce production costs and improve management. Here and there a significant note of dissent is sounded because, in the opinion of some executives, the coal operator has not been willing to meet the manufacturer half way.

Going a step farther, there are some manufacturers who emphasize that ways must be found to make the sale of coal more profitable to the producer since the prosperity of the manufacturer of equipment must rest upon prosperity in the industries to which he sells. The part new equipment may play in this movement is the subject of interesting comment in this symposium.

Must Further Electrification In Mining Operations

ANSWERING the question of how the electrical manufacturer can best co-operate with the coal operator to improve the technical processes and financial position of the mining industry during the coming year, *E. M. Herr,* president, Westinghouse Electric & Manufacturing Co. says:

"In the past twenty-five years American industry as a whole has greatly increased its productiveness and the returns to both management and worker by doubling the amount of power used per worker. The fundamental principles involved in this process are now quite generally accepted as sound for certain industries by industrialists and economists, and experience indicates that they also apply in the coal-mining field.

"It is, therefore, I believe, the feeling of all manufacturers of electrical mining equipment that they can best serve the coal-mining industry by extending the use of power-operated mining machinery and by developing new applications so that still further increases in the use of power will be made possible.

"The peculiar nature of coal mining makes it essential that that industry and the electrical industry co-operate wholeheartedly in this work, and the assurance of this co-operation on their part is, in my opinion, the manufacturers' most effective contribution to the welfare of the mining industry."

Closer Field Contacts Needed As Aid to Improvement

IT IS the belief of *William H. Woodin,* president, American Car & Foundry Co., that "the manufacturer of coal-mining equipment can best help to improve technical processes by going to the mine and working with the engineers, with a view of providing them with equipment best suited to their individual requirements. It follows that if the manufacturer by this method can produce equipment that will improve the technical processes of mining, it will reflect a financial benefit to the coal operator.

"If mine operators will call on equipment engineers, who are always willing to work out with coal-mining engineers the problem of equipment, it will insure greatest economy of operation. Experience has proved that the operator cannot produce adequate and economical equipment either so inexpensively or so well as the equipment builders, who always stand prepared to ascertain the requirements and to furnish equipment that will attain better and more satisfactory financial results for the operator."

Profitable Operation Demands Complete Mechanization

RE-ESTABLISHMENT of the coal-mining industry upon a profitable basis depends primarily upon the sale of coal at a commensurate margin of profit, in the opinion of *C. C. Austin,* general manager, Mancha Storage Battery Locomotive Co. "That statement," he continues, "seems trite, yet it sometimes helps to get a clear vision of a problem if that problem can be stripped of all non-essentials.

"The price of coal is the mining cost of the marginal producer and is a figure over which mining companies have no control. Their only recourse, then, is to reduce the cost of mining the coal, and in our opinion this can be accomplished only by the complete mechanization of the mines. This means the application of the proper blasting methods to get the best results, substitution of machine drilling for hand drilling in most cases, installation of cutting machines to displace any hand mining which may persist today in a few mines, installation of proper loading machines wherever practicable and the substitution of mechanical haulage for all animal haulage wherever the animal haulage is unprofitable, together with the installation of proper preparation equipment on the surface to prepare the coal properly for sale. Hand labor

and animal labor must be minimized to the last degree.

"Manufacturers can be of the greatest service to the industry only when they employ as representatives technically trained men competent to pass judgment upon these technical matters, the assumption being, of course, that their product is brought to the point where it is economical to the last degree. Conversely, the mining industry can help itself as its executives weigh and consider the suggestions made by competent manufacturers and representatives.

"The coal industry faces the biggest engineering program that has confronted it at any time during its history and if its officials and the manufacturers both act upon its problems from an engineering standpoint, we think that the main body of the industry will come through with flying colors, but we venture the prediction that those who have neither the technical training nor the money to carry out this engineering program will be forced out of the business."

Expansion of Fuel-Processing Will Open New Markets

"WE ARE firmly committed to the idea that the day is past when coal can be looked upon as a raw fuel to be burned under the present conditions wherein the very valuable byproducts are lost," asserts *Col. H. D. Savage,* vice-president, International Combustion Engineering Corporation, "but that we must look upon coal as a raw product to be treated, and its several constituents conserved for their most efficient and best use. This, of course, leads to low-temperature distillation wherein the byproducts are taken and only the resultant char or processed fuel used for combustion purposes. An eminent engineer recently made the objection that this caused the mining of more coal, which is quite true, as the best low-temperature processes yield about 70 per cent processed fuel.

"While, under such treatment, the miner would produce more coal for a specific purpose, this is not an economic waste, as the value of the byproducts recovered from the total tonnage, is many times the value of the additional tons required for processing. A keener interest in the more intelligent use of their product under such conditions, would seem to indicate a possibility of benefit to the industry, and the co-operation by the bituminous interests in this endeavor opens up new markets and possibilities."

Management Must Be Fair To New Equipment

WHAT is really needed, in the opinion of *Frederick K. Copeland,* president, Sullivan Machinery Co., is more co-operation from the coal industry. "Either from class prejudice or from years of experience," explains Mr. Copeland, "I am inclined to think that in your question [How can the manufacturer best co-operate with the operator to improve the technical processes and financial position of the industry?] you have the cart before the horse, and that it would be more in order to ask how can the coal operator co-operate with the manufacturer of coal-mining equipment?

"It is a curious psychological fact that when the manufacturer of new equipment approaches a coal operator he is liable to be looked upon with suspicion, as if he were trying to take some money away, and if by hard work the manufacturer is able to persuade the operator to try the equipment, nine times out of ten he and his machine are turned over to a semi-hostile superintendent or pit boss, and the apparatus is placed in the mine, not to make a showing under average conditions, but where the conditions are the very worst possible. I am not accusing all coal operators of this attitude, but I think other manufacturers will agree with me that it is not uncommon.

"I am talking more particularly now about equipment to be used underground, where it is out of the easy observation of the owner or manager and where its fate may depend on lack of co-operation of men who have no possible interest and who are naturally more or less hostile to any new innovation.

"Take, for instance, the loading machine, with which many manufacturers are struggling. In my judgment, the success of the ideal loading machine, if such a thing has been discovered, is 25 per cent machine and 75 per cent underground management, and the greater the capacity of the machine the more the question of underground management becomes a determining factor. This same condition affects to a greater or less degree all apparatus used underground for the extraction of coal.

"Another point which I think is frequently overlooked by the operator is if a new piece of apparatus is a success, the operator receives a much greater pecuniary return than the manufacturer of the machine, and if it is not a success, the years of effort, expenditure for drawings, patterns, engineering and supervision have been lost to the manufacturer. I imagine that no one has any idea of the vast amount of money that is being spent throughout the country by manufacturers of apparatus for extracting coal, now and in previous years, and I also thoroughly believe that the manufacturers of apparatus of this kind are more than willing to co-operate generously with the operators.

"My suggestion to the industry, in answer to what you are trying to bring out, would be that the operator should first make up his mind whether a proposed piece of apparatus may or may not be a labor saver and a profit maker to him; if not, turn it down; but if he does believe that it has merit, to so organize his operation and so educate his people who come in contact, to do everything in their power, as far as conditions go, to make the experiment mutually profitable."

Sales-Engineers Can Serve As Advisers to Industry

"THERE are two distinct and important services engineers and manufacturers of coal-mining equipment can render coal operators," states *Col. Warren R. Roberts,* chairman of the board, Roberts & Schaefer Co.:

"(1) By persuading operators to make a discriminate purchase of improved equipment wherever replacement of old equipment works decided economy in operation; (2) also to purchase equipment to enable them to market a much better product and at the same time handle and prepare this product more economically. Both these suggestions are entirely practical, as is evidenced by operators who have already made such improvements."

Share Engineering Data With Coal Operators

ACCORDING to *J. A. Donaldson,* president, Joy Manufacturing Co., the manufacturers of mining equipment can best co-operate with the coal producer in promoting the financial stability of the industry "by gaining and retaining the confidence of the coal operator through the dissemination of engineering and economic facts pertaining to specific mining phases constantly being gathered and studied by the trained and

highly specialized manufacturer's staff, which point the way toward more efficient and lower cost production; and by correctly analyzing and reporting upon the solution to particular mining problems coming within the scope of the manufacturer's product."

Electrical Engineers Studying Coal-Mine Problems

"CONTRIBUTION in the form of sound engineering and the proper application of electrical apparatus has tended a great deal toward reducing the cost of producing coal," says *J. G. Barry,* vice-president, General Electric Co. "Automatic underground substations, automatic starting and stopping of pumps equipped with electric motors and other devices used underground mean a saving of labor and more efficient operation. Electrical engineers are giving much thought and attention to this important problem."

Sees Profit in Conversion Of Slack Surplus

DEVELOPMENT of machinery for the low-temperature carbonization of screenings to reduce the volume of slack coal is offered by *Otto H. Falk,* president, Allis-Chalmers Manufacturing Co., as one way in which the manufacturer can aid in stabilizing the coal industry.

"Screenings which are produced in the bituminous coal mining industry are an attendant burden which to many operators presents a loss, due solely to the fact that the volume of such coal is in constant surplus, far beyond the consuming ability of the utility and industrial plants that are equipped to use it. In consequence such operators are faced with the problem of selling the prepared sizes at a figure sufficiently high to carry the burden of loss on the screenings and earn a net return on the whole operations.

"Conversion of this grade of coal to a higher form value by means of low-temperature carbonization presents an opportunity to the operators for realizing a just return for the fuel value of the screenings.

"The products of such processing include a smokeless and easily ignitable fuel very desirable for the domestic market, when produced in solid, dense form.

"The products being in such a form as to be easily transported to the market makes it preferable to locate the processing plant on the mine property adjacent to the screening plant. The economies realized from such a location of a low-temperature plant make this industry especially inviting for the bituminous coal mine operator.

"Allis-Chalmers, in conjunction with others, has for some time been devoting its attention to this problem in an effort to develop apparatus which will bring commercial results. In view of the present widespread interest in the subject it is not unreasonable to expect developments and improvements along this line in the near future."

Manufacturers Ready to Give Sound Engineering Counsel

"THE BEST WAY in which manufacturers of coal-mining equipment can co-operate with coal operators," writes *William Lawrence Saunders,* chairman of the board, Ingersoll-Rand Co., "is by the use of engineering and scientific methods in salesmanship. A salesman whose chief object is to get an order is a pretty poor specimen to go before the operator of a coal mine.

"I have endeavored all my life to put engineering and efficiency first in business with mining men. Through the large experience which salesmen of this company have among mines of various kinds and under varied conditions they are equipped to advise the operator what is best for his particular case, how he may save them money in the operation of the mines and what improvements he can suggest as to processes and machinery to achieve this result."

Co-operation Will Develop Better Equipment

"THE problems of the coal operator and the manufacturer of mining equipment are mutual and each is necessarily dependent on the other for success," says *J. C. Wilson,* manager of the mining sales division, Ohio Brass Co. "The manufacturer has no excuse for existence unless he can contribute to the solution of the operating problems of the industries which they serve.

"The manufacturers who serve the coal industry must accept the responsibility for seeing that the equipment that they develop, manufacture, and offer for sale is a sound investment and is a real contribution to the more economical production of coal.

"Intelligent development by the manufacturers of mining equipment depends largely on the co-operation of the operators in submitting their problems with definite information covering the results to be accomplished. With this information, the technically trained staff maintained by all up-to-date manufacturers can develop more efficient equipment which will result in increased production and more economical handling which will in turn lower the cost of coal at the tipple.

"In short, the operators and manufacturers must work together on these problems if satisfactory results are to be accomplished. Close co-operation will result in better equipment and more economical operation and in the final analysis, will be beneficial to both."

Knowing Fuel Performance Will Widen Sales

THE advantages of knowing fuel performance by actual experience are stressed by *R. B. McClave,* general manager, McClave-Brooks Co. "It would seem the better part of wisdom for the operators to equip their own power plants with the most efficient type of fuel-burning equipment and thus place themselves in a position to demonstrate how their particular fuel can be burned most efficiently and economically.

"If this is accomplished they will then be in a position to go into the open market with actual test data with regard to the burning of their particular fuel and in this manner sell their coal to the public and not assume the attitude that the public will come to them to purchase their fuel, merely because they are engaged in mining it.

"It would seem that much closer co-operation between the coal producers and the manufacturers of coal-mining and coal-burning equipment would result in greatly improved conditions for all concerned."

Coal Operator Must Take Lead in Co-operation

THE QUESTION asked by *Coal Age* should be addressed to the coal operators, says *Thomas Robbins,* president, Robins Conveying Belt Co., because "all opportunities for co-operation with the manufacturer of coal-mine equipment must be initiated by the operator. The manufacturer has generally been found willing to co-operate to the fullest extent, but the problems are the operator's, and should be stated by him."

Better Understanding of COAL PROBLEMS

Points Way to Engineering Progress

By Andrews Allen
Allen & Garcia

IN MAKING a dispassionate review of economic conditions and engineering accomplishments of 1927 in the coal industry one is struck by the smallness of actual results. The demand for coal has been only moderate. Labor matters have occupied much of the attention of operators in part of the bituminous field while contention as to freight rates has been a constantly disturbing element.

Under these circumstances one can hardly look for much definite accomplishment but must rather endeavor to find evidence, if possible, of intelligent understanding of principles which will lead in time to accomplishment—and in this respect 1927 has not been an unfruitful year.

Of course there are too many mines and miners, at least there are too many to suit those whose conception of business is a means of making a lot of money easily. That day is past in coal as in all of the older industries. Some coal mines are making good money today. No entire industry can remain permanently on a losing basis. There are too many poor mines, but there are not enough good ones. Other industries have faced the same problem and, nevertheless, have eventually established satisfactory fundamental conditions.

Coal mining is seasonal, but not more so than many other industries. We are beginning to find out that the coal industry is no exception to the general rule, and that it can be organized and operated at a profit if its problems are met in true scientific fashion with especial attention to the effective substitution of machinery for hand labor.

Years before the present universal interest in mechanization a good friend of mine, who had retired from active business after a life spent as a pioneer in the mechanization of the iron industry, happened to visit a coal mine and was fairly appalled by the waste of human labor. He studied the conditions deeply and I had many discussions with him in which I gave him a little technical help in correlating his knowledge to coal. The result was a series of popular articles in a local paper calling attention to the primitive situation in the coal industry. One thing that he said in regard to hand loading of coal and the practice in some fields of "cribbing" or "topping" the car to the limit stands out especially in my memory:

"In a mine loading a thousand cars a day, each car measuring 25 ft. in periphery, your miners are building five miles of useless 'dry wall masonry' every day and somebody is paying for it." And I might add we are still building many hundred miles of dry walls each day so that somebody can pull them down again like children playing with blocks.

His vision and our dreams have not yet come true, but 1927 has been distinctly a year of progress in this direction. We have a little clearer conception of the problem and are beginning to attack it more successfully. There are now many successful loading machines, conveyors and other auxiliaries and there is already a procession toward the rear of those that have been tried and found wanting.

BUT we have only just started. We certainly can't brag of a 30c. or 40c. saving per ton when our loading machines are working at 30 per cent efficiency. We certainly cannot brag of our conveyor system, no matter what it saves, as long as the time and cost of moving and maintenance is as at present. We know now from sad experience that finding a machine that will work is hardly 10 per cent of the problem.

American genius will not rest on its present laurels and I am confident that a few years more will double our present accomplishments.

What does this mean? First and foremost larger employment of capital with a greater concentration of mining operations in the hands of those who have capital or can command it. The old law of survival of the fittest will work out the answer. There are going to be fewer poor mines and there are going to be more good ones. The cost of coal is going down. There will be fewer coal miners but those who stay in the industry will be well paid.

Organized labor sees its ranks depleted by the use of machines and endeavors to stay their progress. It might as well try to halt the tides, for it is an ultimate necessity that the industry be mechanized and operated under the full control of its responsible heads. In opposing this progress the union is only breaking itself.

It does not necessarily follow that the biggest organizations will survive. These are some advantages in size, especially in ability to regulate production to demand and in the diversity factor of several fields, but comparatively small operations ably managed and amply financed will always be able to hold their own. Superior quality of coal and marketing advantages will always weigh heavily in the balance for success, irrespective of size of operation.

An increasing proportion of miners now live in towns or villages where there are more advantages and better living conditions for themselves and their families, making use of hard roads and automobiles to go to and from work. This is an economic change of first magnitude and is already resulting in a more mobile labor supply, which favors diversification of industry and economical operation of mines to meet a fluctuating demand. At the same time it gives a better chance for the children, which is a social benefit of tremendous importance. Operators

may sometimes find it advisable to spend a little more money on roads and avoid the cost and maintenance of expensive camps which never pay dividends—and all will be better off.

From a strictly engineering standpoint 1927 has witnessed the début of several new loading machines, improved cutting and shearing machines and several new developments in conveyors for gathering, transportation and loading. We also have the CO_2 cartridge for shooting which operates without flame or heat—safe shooting as often as you like in gassy mines.

But we have seen no great amount of progress as yet in the development of some continuous process for mining coal, with or without the use of explosives. It seems to the writer that there is no industry in which the advantages of continuous 24-hour operation are greater than in coal.

ON THE other side of the picture we have the user of coal developing more efficient ways of burning it and intent on using the most economical source of power or heat, whether it be coal, oil, coke, gas or hydro-electric power. In developing efficient apparatus for producing power from coal it is necessary to use a fuel of uniform standard, and so has come the demand for high fuel value and, more than all else, uniformity. In buying coal, the fuel value, ash and sulphur, ash-fusing temperature and many other characteristics are carefully determined and specified by the buyer. The operator who pays no heed to these requirements is losing his best possible market.

When we mine mechanically we must realize the necessity in most cases of mining the entire seam. Gobbing in the mine, even if possible, is expensive and very wasteful. A modern coal mine must be a manufacturing plant where the raw material from the mine is converted into fuel suitable for diversified uses. Mechanical cleaning as well as sizing is, therefore, forced upon us, for, except in the cleanest seams, no hand process alone is capable of cleaning the coal as mined.

There has been considerable progress in mechanical cleaning in the past year and several large cleaning plants, both wet and dry, have been built. There are more to follow. Coal must be cleaned and maintained at a uniform standard of excellence irrespective of fluctuations in quality as mined.

The concentration of smaller operations into larger ones is steadily going on. Long haulage is not a serious hindrance under most conditions and larger plants make it possible to employ cleaning methods and to obtain efficiencies that are not possible in smaller units.

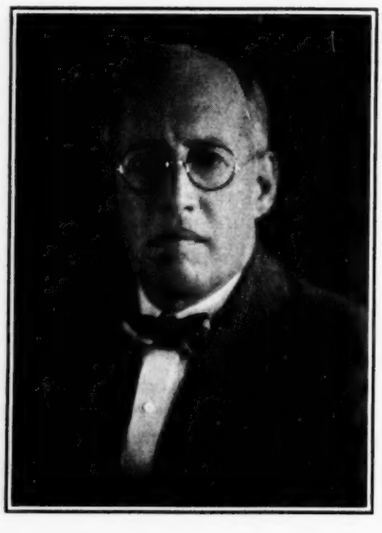
There has also been much progress regarding cleaning methods. It has come to be realized more than ever that coal as mined is an extremely complex material, both chemically and structurally. Any cleaning problem must be thoroughly studied before undertaking to build a cleaning plant.

As most present-day cleaning methods are based principally on gravity, the first step is to make a thorough screening and float-and-sink analysis of the coal. This will determine the possible improvement of your coal, together with the losses of material in the cleaning process.

The commercial side of the question should next be studied. What markets not now available can be reached with a cleaned and uniform product and what will the balance sheet look like when selling coal in competition with coal of equal quality? What will be the effect of cleaning on the fusing point of ash, etc.? What sizing is necessary to supply the demand for clean coal?

A careful study should be made of the coal from different sections of the mine or acreage, and face samples should be studied to determine where the various impurities occur, the nature of these impurities and their hardness—which may have a large influence upon mining methods—so as to bring out the impurities in the best condition for easy removal. Some impurities cannot be removed by gravity and it may be possible to segregate such material in the mine.

Andrews Allen



The choice of cleaning methods comes next. There are many to choose from and their advocates sometimes go to fanatical extremes in propounding their claims. Fundamentally, as a general proposition a cleaning method should be simple and should do as much of the work as possible without excessive subdivisions as to size. Complications and refinements may be necessary but they should be introduced only to increase the recoveries or improve the product.

The theory of "hindered settling" imposes a strict limitation on the range of sizes in any one machine but there are other factors which may be utilized, and while we may build our practice around a single factor it is well to remember that Nature has a wonderful memory and never forgets a factor in her calculation. Some of the most successful cleaning of coal has been done over a much larger range of sizes than our preconceived theories would lead us to expect, and here, as in many other things, a new theory must be evolved to square with practice.

THERE is a tremendous practical advantage in cleaning coal before sizing, and recent work has shown that this is generally possible both in wet and dry processes.

We must also get over that bugaboo of wet coal. There is no reason why coal of any size would stay wet after washing unless we want it to or do not care. There are many cases, however, where dry cleaning is advisable and efficiencies may be hoped for in time comparable with wet washing.

The solution of the mechanical cleaning problem is well on its way. There will be more progress in the future than there has been in the past. The plants will be better conceived, more carefully planned and the results will justify the greatest amount of study and experiment that can be given to this problem.

The writer expects to see a wonderful improvement in the industry brought about by concentration, organization, mechanization and preparation, and it is not too much to

expect that, through the influx of new capital, many if not all of the ills which now beset the industry will settle themselves through the silent yet inescapable operation of natural laws.

One word more before closing: It will be noticed that great stress has been laid on the useful and necessary employment of capital in the industry, though capital has had a rather disastrous experience with coal securities. It is sometimes overbold, but now it is extremely timid where coal securities are mentioned. Of course the requirements of sound finance regarding underlying values, size of coal reserves and earning power, proportion and amount of various grades of securities must be rigidly adhered to, but coal securities must come back and there is no good reason why they should not if they are underwritten only after an investigation which clearly demonstrates that the operation is following modern lines and is one of the "fittest" that will survive.

Modernization Makes Steady Headway In Alabama Coal Industry

By James L. Davidson
Secretary, Alabama Mining Institute

DURING the past year much has been done in and about Alabama coal mines to eliminate hazards to employees, in improving the quality of the product and in the endeavor to lessen the cost of production without reducing wages. This has had to do principally, among other things, with:

(1) Removing and neutralizing coal dust; applying water to the cutter bar of mining machines; rock-dusting; provision for adequate ventilation; installation of permissible electric cap lamps; the use of permissible explosives; timely and sufficient timbering (and enforcement of effective rules respecting this as well as other rules designed to protect the workmen); employment of safety engineers, inspectors and section foremen; education in accident prevention.

(2) The elimination of refuse underground before loading the coal has received much attention. This includes the abandonment of shooting on the solid, proper balancing of blasting holes, reduction of charge to amount of powder barely necessary to pull the coal and the cleaning of the coal at the working face by the miner. During the past year several new plants for further cleaning and preparing the coal after it is raised from the mines have been installed and a number of those previously in use were brought up to date.

An intensive study has been made by managers and engineers of coal mines in Alabama of the matter of removing sulphur and ash from the coal after it is mined and in sizing and preparing it so as to make it especially desirable and satisfactory for the particular use of the consumer

James L. Davidson

and to meet his needs for fuel. The result is that a new type of coal washer has been designed and the older types have been much improved.

(3) Improved mining methods as a means of reducing the cost of mining, assembling and handling the output also has received constant consideration. Although gradual progress has been made at most mines in this district, this has not involved the employment of new methods or processes as much as intelligent application of those already known to the new conditions encountered at each place, together with the construction and installation of modern equipment, machinery and structures.

New steel tipples and loading facilities have replaced old ones at several places and at others the haulage systems have been remodeled and reconstructed. Additional electric locomotives, motor generators, electric-driven hoists and equipment have been installed. Several mines were completely electrified during the year and at others new pumping plants have been put in.

Some of the older mines were closed down during the year, but the output of these will be supplanted by that of a number of new mines which are being opened, thus providig for continuity of production during the present year.

The matter of providing means of coal burning that will produce heat and power, or both, at less cost to the user than other kinds of fuel or energy now in competition with coal is an important engineering problem to be considered and solved during 1928. That of roof control and cleaning the coal underground is another engineering problem that will have to be mastered before mechanical loaders can be employed successfully and economically in the coal mines of Alabama.

West Virginia and Kentucky Gain Slowly In New Machinery and Methods

By H. N. Eavenson
H. N. Eavenson & Associates

IN THE coal fields of West Virginia and Kentucky the year 1927 was very quiet in the lines of new construction, improved mining methods and machinery, and the coming year apparently will follow much the same course.

Practically no new mines were opened in this territory during the year with the exceptions of the new shafts of the Island Creek Coal Co. on Mud Fork, Logan County, W. Va., built to provide increased capacity, and the mine of the Clover Splint Coal Co. on Clover Fork, Harlan County, Ky., which opens a small area of exceedingly high quality coal both chemically and physically.

In these states, as in western Pennsylvania, the main interest of most coal men is in better preparation. In the few new tipples that

have been completed during the year, to replace some destroyed by fire, better handling methods have been followed and preparation is much better than in the older plants. The tendency is toward increased use of mechanical methods of cleaning.

In the low-volatile fields several small installations of dry cleaners have been made, and at Berwind, McDowell County, W. Va., a large dry cleaning plant has been installed to replace an old wet washer there. An installation of the Menzies hydro-separator at the Caswell Creek mine of the Pocahontas Fuel Co. has produced satisfactory results and is to be followed by two others for the same company, and by others at several plants.

Very little has been done in this section during the year with new mining methods. Several mines have been trying various schemes of long-face workings with but indifferent success, and little new work of this kind is being started. The long-face system of the Consolidation Coal Co. at its Miller's Creek mines in eastern Kentucky is still being worked, but this is about the only instance of this kind which has attained any considerable results. Most of the trials have been in the line of increased room widths or slabbing of rooms in the room-and-pillar workings.

Few changes in mining machinery have been made during the past year. In Kentucky the use of top-cutting machines has been increasing and in West Virginia a number of the new Sullivan undercutting and shearing machines have been installed. Little progress has been made in the loading machine situation. In Logan County, West Virginia, an additional Goodman shovel loader has been installed, and in West Virginia and Kentucky a few Coloders and Joy machines have been introduced, but with the exception of a few mines in the Pocahontas field, there are no mines in this section producing all machine-loaded coal.

H. N. Eavenson

Some progress is being made in the use of conveyor loader systems in a few mines, mainly those working coal under 4 ft. in thickness, and it is probable that considerable work will be done along this line in 1928.

Reports from the H. C. Frick Coke Co. relative to the performance of main-line conveyors at Colonial Mine were most favorable. In September the belt line carried an average of 11,962 tons per working day. Since its installation and up until Nov. 15, 1927, only 9 man-days had been lost due to accident during operation and only 26 man-days on the entire system. This is an excellent record seeing that the belt had been running a little over 3½ years and over 9¼ million tons had been carried by it over a distance of 4½ miles. During that time there had been delays of 45 hours and 25 minutes, or a little over 5½ days.

To prove the absence of degradation in the operation of the belt an ordinary carton containing a dozen eggs was placed on top of the coal and conveyed the full length of the belt line. When taken off not an egg had been broken. A carton buried in the coal had only one egg broken.

During the year the H. C. Frick Coke Co. virtually completed a second conveyor system at Palmer Dock which is designed for a much larger tonnage but which is not as long as that at Colonial Mine. Its total length is 16,398 ft. and its total lift 522 ft. The same company is experimenting with steel sheeting for shaft lining.

Mechanical Loaders Settle Down To Their Jobs

By R. Dawson Hall
Engineering Editor, Coal Age
and
A. F. Brosky
Associate Editor

A YEAR that would have been marked by much progressive effort in the development of loading machinery has had considerable of the edge taken off it by a long-continued strike. However, 1928 is likely to see the progress that was denied to 1927. Meanwhile, if the industry has not learned about new types of machinery, it has certainly found out much about the reasonable use of that which it already has.

In the bituminous fields of Pennsylvania the advance was somewhat spotty. Many of the larger companies made much progress in mechanization, whereas others merely marked time. Big strides were made by the Pittsburgh Coal Co. and the Pennsylvania Coal & Coke Corporation.

At the mines of the Pittsburgh Coal Co. scientific management has a sufficiently long application to prove the merit of detailed administration methods. The Hillman Coal & Coke Co. has shown at the Jerome mine by the use of underground conveyors a saving of one-third in the cost of production, proving that the merit of this type of transportation is not theoretical. The Mountain Valley Coal Co. has demonstrated at Garrett, Pa., that with shaking conveying methods coal can be obtained at greatly reduced cost.

OPERATORS in Pennsylvania even more than in other states are realizing that if loading machines are to be used, means must be found to clean the coal mechanically and that some method must be planned that will avoid the great cost of handling drawslate by hand. Heyl & Patterson have placed on the market a process of dry cleaning coal, the third in the field. An installation has been made of this equipment at Boswell, Pa., for the Davis Coal & Coke Co. The Berwind White Coal Mining Co. has erected a cleaning plant at Windber, W. Va., using American Coal Cleaning Corporation equipment. A bag house collects the dust from the plant. The Pittsburgh Coal Co. has begun the construction of a huge central cleaning plant using the Rheolaveur process. Scrapers and conveyors mined a relatively large tonnage this

year in the thin seams of the central Pennsylvania fields.

Stripping is still increasing its field of operation in the State of Illinois, especially along the outcrops of beds Nos. 5 and 6 in St. Clair, Randolph, Perry, Jackson, Williamson, Saline and Gallatin counties, all in the southern part of the state. New areas have been stripped from seam No. 5 in Fulton County and from seam No. 2 in Grundy County. The companies which have done the most exploration and development work have been the United Electric Coal Companies, the Pyramid Coal Co. and the Sunlight Coal Co. Electric shovels appear to be replacing those driven by steam in the older pits and to be preferred in starting new operations.

The mechanization of loading has made progress in southern Illinois, increasing numbers of loading machines having been installed. The Kathleen mine of the Union Colliery Co. is loading all its coal by machinery.

The introduction of hard roads has fostered the development of small mines which deliver coal by truck rather than by railroad, especially near towns of size. Some of these have equipment far superior to those formerly associated with wagon mining.

Strip Mining at Low Cost in Southwest Points to Recapture of Trade

By Ira Clemens
President, Clemens Coal Co.

PRESENT conditions in the whole coal-mining industry in the Southwest field are varied enough to cause one to hesitate to make any very striking forecast of amelioration in 1928. And yet to a keen observer there have been healthful signs of an appreciable improvement in the demand for and consumption of coal. Prices, however, for various reasons, are likely to remain the same as those which ruled during the year 1927.

The field which comprises Missouri, Kansas, Arkansas and Oklahoma is steadily displacing union miners with open-shop workers. The wage scale on the latter basis is considerably less than the union scale under the Jacksonville agreement, which had been lifting the cost of mining so high as to render it impossible for the operator to meet the competition of the non-union mines of Kentucky, Virginia and Colorado.

This change in wage conditions in the Southwest is bound to have a marked effect on the progress of engineering and the mechanical development of the mining industry in this part of the coal world. The adverse conditions existing under the Jacksonville agreement have greatly encouraged the operator to enter the strip-mining field with its practically unlimited acreage. Hence deep mining, once so flourishing in our district, is being gradually relinquished by the big operators, who heartily welcome the ushering in of the strip-pit age. The thickness of our strip-pit seams vary from 1 to 4 ft. with a consequent difference in the quality of the coal.

Strip mining under a lower wage scale points happily to a return of the coal trade naturally belonging to this field.

We now have new stoker feeds, various pulverizing devices and the latest contraptions to extract the coal from its hiding places and to convey it to the modern coal car without damage on its journey to the most exacting markets.

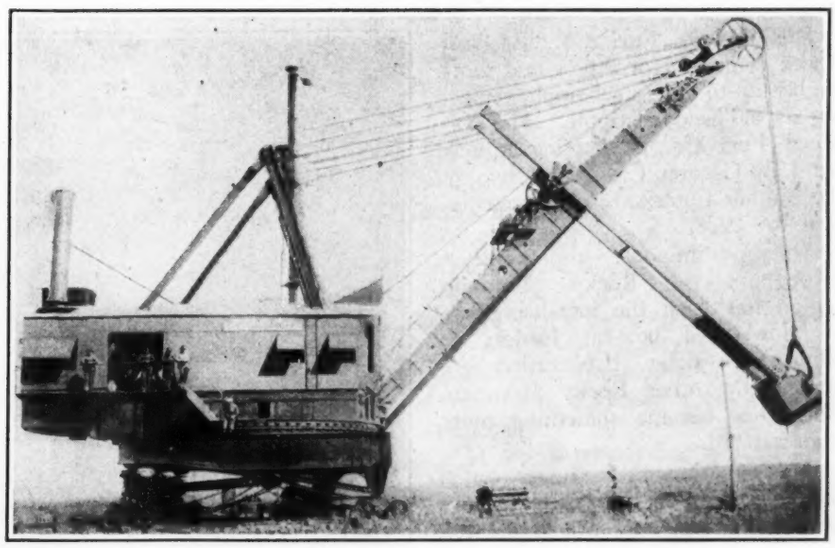
The mechanical devices within easy reach of the operator have enabled the strip-pit industry to make great strides in preparing coal as well as in lowering the cost of production as evidenced by the number of shovels in the district and by the fact that they work from 9 to 18 hours per day. Climatic conditions have been very favorable, hence stripping has been carried on without interruption throughout the twelve months of the year.

The engineering department has relinquished the old type of deep-mine tipple and has adopted a new design more in conformity with the material exigencies of strip mining and with the ever-increasing necessity of eliminating man-power at the mines. There is a growing preference for drop-bottom pit cars, which dump their coal into hoppers holding from 50 to 100 tons each. From the hoppers the coal is then conveyed to the headhouse by means of a flight or drag conveyor, whence it continues its journey to a sizer, where it is machined into the respective sizes demanded by the trade, such as all slack, slack-and-nut, nut-and-lump, railroad coal or any other make.

There is no disguising the fact that much coal has been wasted in the past due to the presence in the seams of sulphur and bone which no ingenuity had succeeded in separating heretofore; but now reclaiming plants separate the sulphur and the bone from the coal.

What the future has in store for the coal industry in the Southwest can scarcely be forecast without endangering one's reputation as a prophet. At any rate, I shall not be a prophet of evil. But the future development depends on a number of factors, some

Big Shovel in Action in Stripping Operation



of which are common to all fields, while others are peculiar to this region.

In this field, oil is a heavy competitor with coal and this has driven many railroads to the use of oil. In the domestic sphere of our social existence we find ourselves almost driven out into the cold by natural gas. What recourse, then, can an operator have other than a staunch effort to reduce the cost of production. If he is to effect a come-back at all it can only be by that route.

Preparation and Underground Loading Lead Improvements in Far West

By Benedict Shubart
Secretary, Rocky Mountain Coal Mining Institute
and
Charles M. Schloss
Lindrooth, Shubart & Co.

YESTERDAY and tomorrow! What did the Rocky Mountain coal industry do in 1927? What will it accomplish in 1928? A bird's-eye view of this coal area, 21 per cent of the entire area of the United States, must needs be brief and incomplete.

The two leading lines of improvement have been in preparation and in underground loading. In both these Utah has been foremost. The Independent Coal & Coke Co. has modernized its old tipple at Kenilworth and has installed a new steel tipple for loading open cars only.

The elaborate new tipple of the Utah Fuel Co. at its famous Castlegate mine, which is nearing completion, will serve two mines on opposite sides of the canyon and is provided with a separate dump for each side with conveyors discharging to a central point onto the screens. The latest type extension box-car loader is being installed. Here, as with the comparatively new Spring Canyon tipple, expense was subordinated to results.

The Liberty Fuel Co. has just placed contracts for a new and thoroughly up-to-date steel tipple replacing its old wooden tipple. The National Fuel Co. is erecting a new plant in Gordon Creek and two or three other tipples are in contemplation for 1928.

Among minor improvements throughout the Rocky Mountain region has been the increasing use of slow-speed box-car loaders to eliminate breakage. Preparation here and in the other Rocky Mountain states has become something more than a word.

The experiments in underground loading started in 1926 in Utah have been to a large measure successful, and practically all the mines have extended the use of machines. The Liberty Fuel, Independent Coal & Coke and United States Fuel companies have increased their number of loaders and the Standard Coal Co. is installing loading equipment. The Utah Fuel Co. is experimenting at Castlegate in its very thick coal, while the Blue Blaze Coal Co. is using a loader in the development of a new mine.

The Columbia Steel Corporation has obtained coke contracts necessitating more coke ovens at the Provo plant. The mine output will be increased to furnish this coal.

It is noteworthy that practically all the underground loading developments in Utah have been on the room-and-pillar system, comparatively no longface work being done now and but little having been tried.

The Standard Coal Co. has completed in record-breaking time a long rock tunnel opening a new mine which is being rapidly developed. A power shovel is being installed for handling this coal.

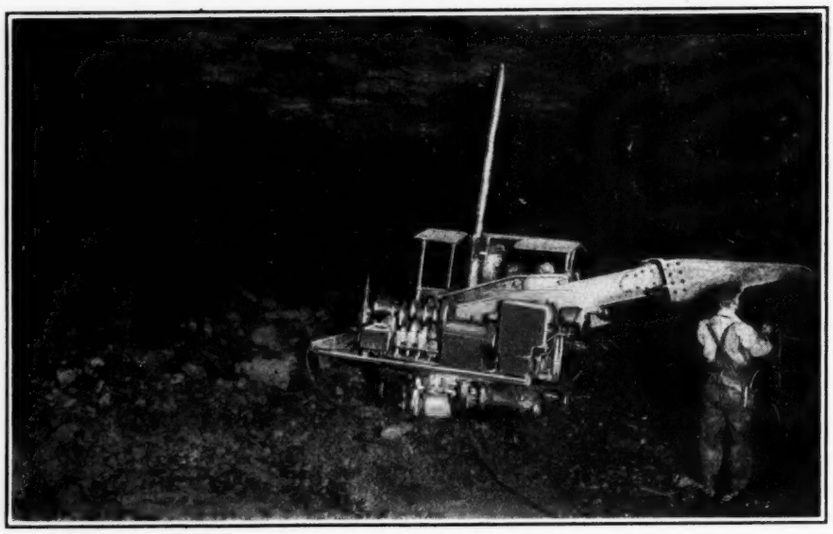
Colorado is finally taking a firm hold on preparation. The Colorado Fuel & Iron Co. has made minor improvements at four plants and has thoroughly modernized its Kebler tipple with picking tables, loading booms and an up-to-date box-car loader. All operators are looking toward better improvement of their product.

A few new mines were opened. The Keystone Coal Mining Co. in Routt County, the Pacific Coal Mining Co. at Walsenburg, the Hartman Exploration Co. at Lafayette, are among the new companies and operations. The Fraker Coal Co. installed a new tipple in Routt County. In general, however, the improvements throughout Colorado were not numerous or large.

In underground loading little was accomplished, although the Victor American Fuel Co. has been doing some very satisfactory experimenting in its Routt County mines, and the Colorado Fuel & Iron Co. has been far from inactive.

An outlaw strike sponsored by the I.W.W. has seriously handicapped the industry in Colorado since early October, but has proved a great help for the neighboring states of New Mexico, Wyoming and Utah. Although the Colorado mines are working at about 75 per cent capacity, the threat is still overhanging and the strike is far from being settled. Another serious menace is the construction, now under way, of a pipe line to bring natural gas from the Ama-

Power Shovel Working in 16-Ft. Utah Coal



rillo (Texas) fields to Pueblo and Denver.

The extension of the use of shearing machines has been quite marked in Colorado. In spite of all controversy regarding the value or disadvantages of shearing, those using these machines appear well satisfied with the results they are getting.

About the only favorable symptom for the future of the coal industry in Colorado is the extension of the steel plant of the Colorado Fuel & Iron Co. at Pueblo. The modernization of the mills, together with the placing of huge orders by the railroads, cannot fail to be reflected in general prosperity for the entire territory just as the continued growth of the business of the Columbia Steel Corporation in Utah is building up the commercial importance of a territory hitherto in no way industrial.

THE situation in New Mexico closely follows that in Colorado. The larger mines in New Mexico have been doing some excellent constructive work in underground loading with a gain of valuable experience.

For 1928 Wyoming offers no outstanding prospects although the winter has been prosperous and 1928 dawns with a good balance on the right side of the ledger. The only outstanding construction work was the opening of No. 5-A mine and the building of a thoroughly up to date tipple by the Kemmerer Coal Co. at Susie. This company has been putting its mines largely on a mechanical loading basis, using conveyors, as the seams have a pitch of 12 to 18 deg.

The Union Pacific Coal Co. has done some development work and has materially extended its underground loading program. Its experience has been noteworthy. With conditions varying from comparatively flat seams of 7-ft. coal with excellent roof at Rock Springs, 30 to 40 ft. coal with 17 deg. pitch at Hanna mine, and 6 to 8 ft. coal on varying pitches with poor roof at Superior, the company is loading coal under all of these conditions successfully. Except for the fact that the coal is clean and that particularly large coal is not essential, the work at these operations is an object lesson in successful mechanical loading.

The situation in Montana, as in Colorado, is being complicated by the introduction of natural gas. Here again the outstanding feature of 1927 was the introduction of mechanical equipment underground at the mines of the Roundup Coal Mining Co., the Republic Coal Co., the Anaconda Copper Mining Co. and the Montana Coal & Iron Co., where a great deal of experimental work is being done with promise of success. So far no mine in Montana is actually operating as a mechanically equipped plant underground, but many of the mines have spent a great deal of money in experiments and more will be spent in 1928.

In the line of safety work, much good work has been done by the Rocky Mountain Coal Mining Institute, and the publication of the revised edition of the safety code has created a great deal of comment throughout the country. Requests for the code have been received from all over the United States.

Engineering Effort in Anthracite Field Stirred by Keen Competition

By E. J. Gealy
Associate Editor, Coal Age

KEEN market competition and a determined effort to reduce operating costs have added stimulus to engineering improvements and modernization in the anthracite region of Pennsylvania. Oil, coke, gas and bituminous coal have become such serious competitors in the anthracite consuming territory of the country that the hard-coal operators have set before themselves the task of winning back lost markets and retaining present markets by turning out fuel of the best quality and doing their utmost to merchandise it along the most successful lines.

The pressure for a uniformly high-grade product has reflected itself upon operating methods. In some instances capacity and costs have been temporarily sacrificed to obtain the best grade of fuel possible. In such cases the engineering staffs have faced a serious problem in trying to hold down cost and maintain high quality.

This task has become more difficult because of natural mining conditions. Coal is now obtained from thinner, deeper and more irregular beds than in the past. As the working places advance larger areas must be timbered, ventilated, dewatered and maintained, while at the same time much more capital outlay must be made for transporting and preparing the product.

The past year has seen the beginning of more concentrated mining effort. Old, expensive, hard-to-mine properties are being abandoned or limited in production. Mines where large tonnages can be obtained and prepared are being re-equipped to meet the new conditions. Even large, high-capacity mines, where possible, are being combined and their product is being prepared in centrally located breakers. Then, too, there have been introduced on a larger scale several relatively new labor-saving and cost-reducing preparation processes. After much experimentation and study minor problems and adjustments have been worked out and the broad adoption of wet process cleaning systems seems to be quite certain.

Automatic equipment is playing no small part in overcoming the problems of the industry. Inside the mines new types of shoveling and loading machines now common in bituminous regions are being employed; conveyors and shaking chutes are effecting highly satisfactory results where either thick or thin coal is mined. Automatic loading and car dumping has speeded up the handling of cars.

In the breakers, power dumps, automatic feeders and easily controlled cleaning processes insure the regular and steady flow of coal that is necessary for the production of a uniformly high-grade fuel. Loading booms on the shipping end of the process eliminate much of the breakage and stratification of coal so common with colliery loading chutes.

Automatic electrical equipment is being used to a greater extent in the operation of nearly every modernized mining and preparation plant. Automatic substations, automatic pumping units and automatic fans also are now common throughout the region.

Strong, well-designed material-handling equipment suitable for large capacities is replacing small units; this is in keeping with the trend toward concentrated operations at points most advantageous for large tonnages.

The use of permissible mine equipment is steadily increasing. Higher workmen's compensation rates and the desire to reduce accident hazards

further have brought about a recognition of the fact that permissible equipment is desirable not only because of its greater safety from gas explosions but also due to the reduction of fire and shock hazards.

Extensive study has lately been given to the crushing and sizing of coal. Work along this line has progressed to the point where it is now readily possible to select the proper size and type of crushing rolls to obtain almost any desired percentage of the various sizes of prepared coal. Further studies also have enabled the producers to cut down the quantity of good coal lost with the refuse and the amount of non-combustible material witih the marketed product. Great care also is exercised in preventing either coal or refuse being carried away into nearby streams with the wash water. Storage of silt, because of its future market possibilities, is now being carried on extensively.

IN recognition of the importance of electrical energy in all modernization programs extensive power surveys are under way at some of the larger mining properties. The primary consideration in expending new capital is where it will net the greatest return on the investment. Attacking the problem along this line in most cases results in a decision to invest in mining and preparation equipment. Incidentally, a recent survey of the anthracite region to determine the potential need for power equipment reveals the fact that the anthracite region alone may soon require more power generating capacity than is now operated by some of the largest interstate public utility systems. This conclusion has been made by pro-rating on a per ton basis the power demand now required by one of the most highly electrified anthracite companies. Consequently the problem whether to use custom or mine-generated power is being given much consideration.

Inside mine haulage bears such an important relation to coal production, cleaning and sizing that many improvements are already being undertaken in the mine transportation systems. Concentrated workings mean better track equipment and larger capacity main-haulage locomotives. On the other hand, rapid mine development has brought about a need for more storage-battery equipment so as to obviate the necessity for large expenditures in temporary track, trolley and feeder wire materials. Where gaseous conditions may be encountered the advisability of choosing permissible equipment becomes more important.

The necessity for mining thinner and more irregular coal beds has created a big demand for air-driven drills and air compressors. This condition provides an unusual opportunity for synchronous-motor-driven compressors which perform the double function of efficiently providing air and correcting adverse power-factor conditions.

Improvements in pumping have been quite marked during the past year due to the use of more automatic pumping units. With the rapid increase in pumping requirements the use of automatic pumping equipment has been one of the greatest single factors in combating rapidly rising mining costs. Changes in the methods of providing the most accurate protection have been important. More reliance is now placed in protective equipment operated through the discharge line check valve rather than by means of pressing regulations.

Slush pumps using special chromium and nickel compounds are proving quite successful. Their greater resistance to both corrosion and erosion is eliminating much of the labor and replacement expense formerly occurring by the use of cast-iron or bronze units.

Continuous ventilation, a most essential requirement where gaseous conditions exist, has been made certain through the recent design and application of automatic fan control combining both purchased-power and gasoline-engine drives. Further improvements obviating much expense and duplication of equipment are under way and automatic continuous fan operation is now made quite simple and easy of attainment.

Control of stationary compressed-air equipment without manual attendance is another advancement in the application of electrical energy to mining machinery. Power failures and restarts together with adequate protection to the bearings, governors and valves is provided by the newly designed control apparatus.

IN the drive to effect economies in the production of anthracite the replacement of old steam-operated equipment with new electrically driven units has proved most successful. These changes have made it possible to eliminate the losses and maintenance of long steam lines. Where electrical energy has replaced steam drives operated from long steam lines the amount of energy consumed has in some instances been reduced to one-sixth that formerly taken.

Now that coal must be obtained from thinner and more irregular beds great progress is expected in car-loading and transportation systems. Rather than load coal from high chutes and build mine cars to take the smashing blows which pulverize the coal, determined efforts are being made to find new loading systems by which the percentage of fine sizes will be reduced. An additional benefit sought is a reduction in the weight of cars, so that less energy and difficulty will be experienced in transporting them.

Modern Anthracite Preparation Plant

Fight to Hold Jacksonville Scale Expensive to Organized Labor in 1927

ORGANIZED LABOR represented by the United Mine Workers suffered heavily last year as a result of its fight to preserve the Jacksonville scale of wages in the bituminous coal fields. In Illinois, Indiana, Iowa and Kansas it won a truce only after a suspension that lasted six months. Ohio, western Pennsylvania and the operations in central Pennsylvania which had held to union affiliations during the three preceding years broke away.

The battle lines were drawn early in the year. Members of the Ohio Coal Operators' Association, Inc., at a meeting in Columbus, Ohio, on Jan. 6, voiced their demand for a new wage scale which would be "continuously competitive" with wages paid in the non-union fields of the South. Several days later (Jan. 19) representatives of the operators for the Central Competitive Field as a whole met at Toledo, Ohio, and indorsed this proposal upon behalf of Illinois, Indiana and western Pennsylvania.

The United Mine Workers opened its convention at Indianapolis, Ind., on Jan. 25 and on Feb. 2 the report of its scale committee calling for a two-year contract with the operators on the best terms possible, but with the Jacksonville scale as a minimum, was adopted. Arrangements then were made for a joint conference at Miami, Fla., beginning Feb. 14. This conference soon develop into a hopeless deadlock, with Ohio and Pennsylvania producers determined to accept nothing less than the "continuously competitive" scale and the union as determined to refuse.

As the conference was drawing to a close John L. Lewis, president of the union, proposed that the conference appoint a continuing joint agency to consider how to give financial stability and profit to the industry, to lessen the human hazards, to promote a sales policy which would eliminate sales below the cost of production, to work for a "scientific" readjustment of freight rates. As a condition precedent, however, it was demanded that there be no reduction in wages. This proposal was rejected and the conference adjourned *sine die* on Feb. 22.

The policy committee of the union held a meeting the next day and decided that any outlying district which desired to continue work at the old scale after March 31 pending a settlement in the Central Competitive Field would be permitted to do so without prejudice. This proposal was promptly accepted by Wyoming and other Far Western states and central Pennsylvania fell into line. Michigan also accepted, but the Southwest and Iowa declined. On March 28 the policy committee, at a meeting in Indianapolis, extended the same privilege to districts and individual operators in the Central Competitive Field.

Advantage promptly was taken of this offer by several companies, including the Illinois division of the United States Fuel Co. On the other hand the operations affiliated with the Steel Corporation in western Pennsylvania shut down on March 31. As the strike dragged on more companies, including several prominent operations in Indiana and a smaller number in Illinois, signed up on the interim agreements. On April 7 the scale committee of district 11 (Indiana) met with the strip-pit interests; a new contract was signed April 20.

THE strip-pit agreement led to a demand for a joint parley between the district scale committee and the operators' scale committee of the Indiana Bituminous Coal Operators' Association, representing the shaft-mine producers. Such a conference met May 3 and ended in a disagreement the next day. The first attempt at negotiations in Illinois took place on June 14, adjourned to June 21 and ended in a deadlock over the Jacksonville rates on June 29. A second conference, equally fruitless, was held Sept. 7-14.

Late in September a third conference was called and Oct. 1 the following agreement was signed:

(1) The question of making a wage contract effective April 1, 1928, and all matters relating thereto, is referred to a joint wage commission composed of the president and vice-president of the Coal Operators' Association of Illinois and the president and the vice-president of District 12, United Mine Workers of America.

(2) Said joint wage commission shall with all diligence apply itself to such task and examine into, consider and report on the demands, claims and contentions of the operators and mine workers without prejudice or restriction. The commission shall report in writing its findings and recommendations to a joint scale meeting of the parties hereto to be held in Chicago, February 7, 1928.

(3) The commission will formulate its own rules and methods of procedure and will organize its work promptly and hold frequent meetings. To facilitate agreement upon disputed points the commission may enlarge its number to five, in which case a majority vote shall be binding.

(4) Work shall be resumed at once, the wages, conditions and rules of employment existing March 31, 1927, being extended to April 1, 1928.

Within a few days a truce agreement was signed in Iowa. The Southwest, where intermittent negotiations had been carried on since spring, signed up on Oct. 6 and the Indiana shaft-mines on Oct. 7.

CENTRAL PENNSYLVANIA union mines, which accepted the interim agreement, first staged a conference with the miners on May 24, adjourning three days later until June 15. Reconvening was subsequently postponed until June 21 at the request of the miners. At the June 21 meeting the miners rejected a proposal which involved a reduction of approximately 21 per cent and the conference broke up on June 25. At the end of the month union mines closed down to reopen later on an open-shop basis. The open-shop campaign started gradually but gained in momentum.

No joint conferences were held in Ohio or western Pennsylvania. In the latter field several large operating interests resumed on an open-shop basis shortly after the expiration of the old agreement. Late in May Ohio operators decided to appeal directly to the workers. On June 29 the producers issued an ultimatum calling upon former employees to return to work at wages based on the 1917 scale before July 15. There

was no general response and open-shop operations were later inaugurated.

The major labor development in the unorganized fields was the Colorado strike launched in October by the Industrial Workers of the World.

There also were some minor disturbances in Kentucky. In August the western Kentucky operators voted a 20 per cent increase to their men. This was withdrawn after the Illinois settlement.

Coal Industry's Problems In 1928

(*Continued from page 17*)

where, due to favorable natural conditions as well as lower union mining rates, the cost of production is much lower than in Iowa.

"If the Iowa industry is to survive, this problem must be met. Iowa coal must be produced at a figure that will permit of its sale in Iowa in competition with coal produced under the conditions outlined above. As we see it, there are only two ways by which this might be accomplished: mechanical production or a lower wage scale. It is highly improbable, due to the irregular conditions of mining in Iowa, that mechanization will put Iowa back on the map. This leaves, in our opinion, only the latter alternative.

"Through the co-operation of the United Mine Workers or some other union, or the efforts of the coal operators themselves, we must produce Iowa coal for a much lower labor cost if the industry in this state is to survive."

District Mergers Answer To Overproduction

OVERPRODUCTION, according to *C. H. Mead,* president, C. H. Mead Coal Co., is the outstanding issue to be faced by the coal industry this year. The only way this can be solved, he adds, is by mergers in the various producing districts.

Co-operation Will Stabilize Labor and Prices

"THE most serious problem facing the coal industry is and will be a tendency toward reduction of wages in order to meet low prices being offered by many of the larger consumers," writes *Charles A. Owen,* president, Imperial Coal Corporation. "I feel that much of the low-priced contract business is in anticipation of lower wages. With wages stabilized, the individual operator should sell at a price which will yield at least 10 per cent profit.

"Both labor and price stabilization can only be realized by close co-operation of those in the industry."

Readjustment of Wage Rates Paramount Problem

"WHILE operators in Illinois, along with all other producers, are obliged to recognize the inroads made on coal tonnage through the use of oil and gas, the present ratio of heating value being 3 to 1, as compared to 6 to 1 in 1918," writes *W. J. Jenkins,* president, Consolidated Coal Co. of St. Louis, "I believe our biggest problem is to secure an adjustment of the present profitless and non-competitive wage scale agreement with the United Mine Workers. Adjustment of this wage scale, in my opinion is paramount to all other problems facing the coal industry in Illinois."

Would Establish Basic Costs For Each District

INAUGURATION of a basic cost for coal in each production district which will admit a fair differential between cost and market price is the important problem confronting the industry this year, according to *W. L. A. Johnson,* president, Rayville Coal Co. This can best be solved, he says, by "the acquiescence, through mutual efforts or otherwise, of all factors in coal production to this plan, or acceptance of elimination either by legislation or the natural law of supply and demand by all factors that interfere with the operation of economic laws. There appears to be no alternative."

Getting Back to Normalcy Coal's Big Problem

HOW to get back to normalcy is the coal industry's problem in 1928, according to *John C. Cosgrove,* chairman of the board, Cosgrove-Meehan Coal Corporation. "As I view the industry, I think that it is in a chaotic condition, due to various unusual and, to some extent, artificial conditions which have prevailed during the past few years.

"There has been a very great switching around of markets in the past few years, due to strikes, uneconomic wage contracts, such as the Jacksonville scale, changing of union fields to non-union fields, the British strike and various other things which have tended to throw coals out of their natural markets, to upset the consumers and generally disrupt the normal lines of the coal business. We must get our adjustments made and business back on normal lines, before we can start to build constructively.

"There are two major constructive thoughts which I would recommend: consolidation of coal companies into larger and stronger operating organizations and the working out of co-operative sales organizations to be developed in co-operation with the Secretary of Commerce."

Iowa Needs Lower Wages To Increase Output

"OUR PROBLEM in Iowa," says *C. T. Carney,* vice-president, Scandia Coal Co., "is the competition resulting from the existing unfavorable wage scale as compared with scales effective in non-union coal fields at the present time. This problem cannot be solved by the installation of mechanical loading equipment on account of the physical conditions of the field in Iowa, which prevents their economical operation. As a result, Iowa's market is reduced.

"To restore the Iowa production to its former amount a lower wage scale will have to be made with the miners' union or with the men individually"

Railroads Should Lower Rates Or Pay More for Fuel

"IT IS very hard for any business man to see clearly—if he can so see—other lines of business than his own," says *T. E. B. Siler,* West Virginia Southern Coal Co. "The matter of the greatest importance to the coal industry and the general public that should be remedied first, I would say, is that railroad companies be forced to make a decidedly lower freight rate on coal to the general public or be forced to pay at least cost on the coal that they consume. This to my mind is the most gigantic and unfair business condition that exists in any line of industry to my knowledge.

"I have, in all justice to the railroad companies, been delighted to see that they have been more fairly considered by the general public in the last few years than they were several years back, when they were almost bankrupt by unjust legislation. I believe if all the coal interests in the United States would solidly unite

with the consumers of steam coal and go before the Interstate Commerce Commission they could force the railroad companies to lower their freight on coal to balance the loss on steam coal that is being sold everywhere to the railroad companies below the cost of production.

"It is not fair for the domestic consumers of coal to have to carry the losses of coal companies in producing steam coal, no matter to whom it is sold. Then I think the coal producers should make the railroad companies pay at least cost for the coal they buy.

"Any coal operator who produces a good grade of coal properly prepared is justly entitled, with proper management, to reasonable returns on capital investments, and when that condition does not exist the laborer who produces the coal suffers, and the business is out of harmony and proportion, I might say, with every other business that I know of today. The coal business is about the only one that I know of that is in many respects very sick and needs economic treatment."

Must Stop Selling Coal Below Cost

"AS far as I can see, the biggest problem which confronts the coal industry is to get it to stop selling coal below the cost of production—to at least attempt to secure a reasonable return on the investment; to stop depleting coal properties and get nothing in return for it," is the view of *J. W. Galloway,* president, Maryland Coal Co. of West Virginia.

"Either one big consolidation or separate field consolidations of the coal industry is one of the most important things before the industry. We certainly cannot continue as we are going now."

District Mergers Would Help Distribution Program

OVERPRODUCTION looms as the pressing problem to *P. M. Snyder,* president, C. C. B. Smokeless Coal Co. "A great improvement over the present demoralized condition could be made if the producers could be induced to keep free coal off the market—that is, make only such shipments from the mines as they have bona fide orders for. Better still would be mergers of producing companies in various districts so as to get the coal industry into fewer hands, as it would likely be handled more intelligently."

Must Balance Production With Demand

ONE of the largest problems that confronts the coal industry in 1928, in the opinion of *J. F. Welborn,* president, Colorado Fuel & Iron Co., is the one of adjusting production to the normal needs of those depending upon this country for their coal supply.

"To do this calls for the spirit of give and take and a suppression of the desire to operate one's properties in the face of low demand when to do so will cause the complete closing down of other properties possibly less favorably situated."

Price Stabilization Dwarfs All Other Problems

STABILIZATION of prices—the marketing problem—is the biggest question facing the industry this year, according to *Justus S. Stearns,* president, Stearns Coal & Lumber Co. "Heretofore," says Mr. Stearns, "the best talent within and without the industry has devoted its time to production. As a result we have a highly individualized industry with splendid equipment, economical production and preparation adequate for the demands of almost every class of consumer. The effect of this attention to one leg of the industry has been over-manning, and overdevelopment and consequent instability of prices.

"The marketing of its product at a fair and uniform price is therefore the big problem before the coal industry in 1928. Its solution will be found in mergers and consolidations, it seems to me, or some form of co-operative marketing. The British mine owners, in worse straits than the Americans, are looking in this direction, and something has already been accomplished in West Virginia. It is very doubtful, however, if the operators can go very far in this direction themselves.

"In the producing end of the busines it took the services of independent construction engineers to show the way, so in the sales department it will probably require the services of trained financiers specializing in this line to save the coal operators from exploitation, and the coal market from periodic demoralization through uncontrolled competition.

"The coal industry is of such magnitude that depression therein affects industrial conditions generally throughout the country. The problem is, therefore, a national one in its scope."

Coal Still Needs "A Trade Consciousness And a Trade Conscience"

THE biggest problem facing the coal industry in 1928 is the same problem it has been confronted with, yet evading for many years—i.e., to find itself understandingly—according to *W. K. Kavanaugh,* president, Southern Coal, Coke & Mining Co. "Thos. T. Brewster expressed it many years ago as the need of 'a trade consciousness and a trade conscience.'

"The industry was probably nearer to a solution of its great problem in 1916 than it has been at any other time, but inadvertent prosperity nearly ruined it and made it unreasoning and unreasonable.

"The wave of prosperity has swept over and passed away, leaving increased investments in mines and mine properties—and the weaknesses of the industry's individualistic tendencies magnified.

"The coal industry faces the necessity of finding itself in a national way and conducting its business affairs along a conservative national program, which recognizes both the industry's necessities and the public welfare, or of changing management.

"Government contact, advice and protection, sought anxiously in 1915 and 1916, may be a necessary element in the process of finding a national viewpoint by the industry. This aspect of the situation should not be scorned but rather should be given sympathetic consideration.

"Perhaps the services of a man of broad vision and experience, drafted from other channels than the coal industry, might be helpful in marshaling the various units with their divergent views and interests into an articulate movement for general industrial service and public betterment. It is worth a trial.

"Any plan, to be successful, must recognize the importance of securing the co-operation, loyalty and support of those who labor in the mines. This feature has often been neglected by coal-mine management. Some method, as yet untried, might well be worked out which would appeal to all sections as being eminently fair."

The BOSSES *Talk it Over*

Responsibility for Equipment Maintenance?

"JIM," said W.D., the big boss, as he seated himself in the super's office, "we've got to figure out some way to get more out of our inside equipment, and at the same time reduce the maintenance cost. Getting rid of the mules and installing the loader has increased the tonnage and cut the over-all cost, but that 13c. against equipment is too much."

"I don't know whether you have any suggestions in mind," said Jim after a pause, "but I've been wondering lately if I shouldn't have Shorty, the electrical man, report to me instead of to Mac. Shorty is broad-minded and willing to co-operate."

"Jim, you've hit the nail on the head; that is exactly what I have had in mind, but have hesitated to spring it because many men like yourself who have served their time as mine foreman can see no other way but to have the electrician report to the foreman. In fact they get peeved and resent any mention of a change.

"Most of my time now, as you know, Jim, is spent with our sales organization and our customers. Business is hard to get and price is a factor. For that reason I am taking advantage of every opportunity to learn what is being done to cut costs in other industries as well as our own.

"Recently I learned that many companies have relieved their foreman of the worry and responsibility of equipment maintenance, and it has resulted in lower cost, fewer delays and better inside supervision.

"As I understand it, the chief electrician or mechanic at each mine is allowed to say when a machine or locomotive is to be stopped for repairs. He is charged with all equipment-failure delays and held responsible for repair cost. If he wants to delay a locomotive 20 minutes with the hope of preventing a 2-hour delay later in the day, that is his privilege. I understand that Peabody No. 9 in Illinois and the Island Creek mines of West Virginia are operated that way, and that their maintenance costs are close to rock bottom."

"But," replied Jim, "I understand these mines produce up to 3,000 or 4,000 tons."

"That's right too, Jim, but I have an idea that there are mines with a smaller production than ours where the new system is in use. I think it's a matter of management and that it will be our fault if we can't make it pay. Any way, I'm glad you had at least thought of the possibility. Think it over some more and we'll try to come to some decision when I come down next week."

If you know of other mines where the superintendent or foreman has turned the entire maintenance responsibility over to the electrician or mechanic, let us hear about it.

To how small a mine do you think it can be applied?

Do you think Shorty can save money for the company if he has full charge of all maintenance work?

Will Mac do a better job by concentrating on mining and safety problems?

All mining men are urged to discuss these questions. Letters accepted will be paid for

What Operating Men Say About It

Order System Keeps Check On Efficiency of Repairmen

AT THE present time there are in use hundreds of report forms for repairs, any one of which Jim probably could use to fair advantage. He must first understand, however, that any report put to use must instantly convey to the reader's mind what action is to be taken to remedy or repair the machinery in question.

It has been found good practice in all coal mines using a good deal of equipment to have the chief electrician inspect every piece of machinery on the job at least every other day. If he finds any apparatus in need of repair he will make out an order on suitable form in duplicate, one copy being tacked on a small wood block placed on the machine for that purpose. The night repairmen are then given a list of equipment requiring attention. Upon completion of the job the repairman signs the original order and it is returned to the chief electrician.

Let us presume that the motor or machine so repaired was to break down with similar trouble a short time afterward. The files, being consulted, would show which repairman signed an order for the same kind of a job not long previous. Evidently something was wrong with the man's workmanship.

This system enables the chief electrician to keep close tab on the cost of repairs for every piece of equipment and also provides a check on the efficiency of his helpers. Some repairs that must be made instantly, of course, require that a repairman be placed on the job immediately without the routine order. Many a good piece of machinery has been ruined because of the old-time slogan *"wait until we get time."* The time is *now.*

DONALD MCGEORGE.
Bypro, Ky. *By-Products Coal Co.*

Assures Longer Service As Well as Fewer Accidents

WE HAVE daily proof that nothing mundane is permanent. Wear and tear, time and exposure, are the enemies of man-made things. Proper care and maintenance—the aftermath of inspection—bring about a longer and more useful life to living and growing things as well as to inanimate materials.

During the last half century the average length of human life has been extended by fifteen years. This has been brought about partly by advances in medical practice, particularly preventative medicine and partly through better housing, sanitation and general welfare conditions. This latter has been brought about through inspection followed by corrective action by social workers, health boards and other civic authorities.

For years insurance companies have been advocating thorough, frequent and systematic inspection and maintenance of plant equipment; first, because thereby a longer and more satisfactory service is assured, and second, there is less likelihood of accidents to man and machine. The insurance companies have had signal success in preventing machinery breakdowns and accidents through the work of their own inspectors supplemented by that of the individual plant inspectors.

The truth expressed in the thought of the preventive ounce being worth more than the curative pound is illustrated by the constant trouble experienced with the electrical equipment in a certain plant. The greater part of the electrician's time, as well as that of his assistants, was employed in repairing breakdowns instead of preventing them. As soon as one piece of apparatus was repaired another would be claiming attention, and in the meantime the work the machine was supposed to perform would have to wait.

If Jim and Mac and Shorty could visit your mine what operating problems of your own would you like to discuss with them?

If you could visit their mine what questions would you ask them about their methods?

Write the editor. He will pass the word along.

The management finally was convinced of the need and wisdom of instituting an inspection policy. First there was a general and thorough inspection and a listing of all the apparatus as well as a survey of the loads, the wiring and the protective devices such as fuses, circuit breakers aod relays. Thereafter a systematic weekly inspection was made.

Increased business and the resulting plant expansion necessitated a doubling of the electrical equipment. The repair bills for the half year prior to the weekly inspection service were 20 per cent more than the repair bills for the whole year following, notwithstanding the fact that twice as much apparatus was in use in the latter and longer period. If the machinery breakdown rate had been the same after the plant enlargement as it was before, five dollars would have been required for repairs for every one that was actually spent.

A byproduct of considerable import was the material reduction of the annoying and at times costly stoppage of production due to machinery breakdown. This illustration is drawn from an industrial plant wherein the exposure to deteriorating influences was not great.

If we bear in mind the adverse conditions under which mine equipment must be used we can readily see that the likelihood of machinery breakdown through exposure alone is increased over that of the industrial plant. The necessity of systematic periodic inspection of mine equipment therefore is greater than for factory equipment.

It requires only a few moments to make an air-gap test on a motor and this test will indicate the condition of the bearings. If they are worn they should be repaired at once, for a motor in this condition will soon have its armature rubbing the field coils and a burn-out is sure to follow. Then there will be an expensive rewinding job as well as the repair of the bearing. In like manner a check can be made on all mine equipment, for it is the function of periodic inspection to discover minor troubles and by immediate corrective action prevent them from developing into major troubles.

R. E. SIMPSON
Hartford, Conn.

Report System Is Effective If Everyone Shows Interest

TO ATTAIN the proper degree of efficiency from any kind of mechanical equipment it is absolutely necessary that a practical system of reports be worked out and closely adhered to. Not only will this greatly assist in solving and hence reducing to a minimum the cost of repairs but, by increasing the efficiency of the equipment, will result in greatly increased production.

Reports should be in two parts, the top for the machine man and the bottom for the electrician and repairman. All defects noticed during the shift should be entered in this report by the machine man at the end of the shift and signed. This report should be checked carefully by the electrician and repairman, who, after an inspection, should fill out his section and give a copy to the mine foreman and superintendent.

Going even further than this, I would suggest that a weekly report be compiled from these daily reports, giving in more detail the nature of repairs, causes, cost of labor and material required. With the aid of this report the office can make up the monthly report, which will give the cost per ton for upkeep of mechanical equipment.

The value of any system of reports will vary in direct proportion to the interest taken by the officials in charge. If the machine man or electrician observes there is no interest displayed by the higher ups, he also will become dilatory and lose interest. I am very frank in stating that no set of reports, no matter how good, will be effective if the superintendent and his assistants neglect to show the interest necessary to keep the organization alert.

My advice to Jim is this: Adopt a good practical system of reports on his mechanical equipment, and then get behind it and keep behind it. Then the whole organization will become infused with the spirit, and results will be achieved equal to his highest expectations.

In addition to the reports, rules should

be posted and enforced requiring that mechanical equipment operators go over their machines at the end of the shift, and tighten up any loose bolts or remedy any minor defects. A reasonable length of time should be allowed for such an inspection. This is a case of a stitch in time saves mine.

This reminds me of an experience I had while superintendent of several large mines some years ago. There was one machineman who went over his machine faithfully every night for ten or fifteen minutes when he brought it into the barn. He tightened up any loose bolts, etc., and reported any further defects to the repairman in charge. The cost of repairs on his machine was not half that of the other machines in the same mine under the same conditions and his tonnage was from 15 to 20 per cent higher each month.

Keeping the men who operate the mechanical equipment interested in the condition of their machines means a great deal. I have thought that a bonus system based upon cost of repairs per ton of coal produced might be introduced with good results. But the success of any system that may be introduced to accomplish a specific purpose can be attained only by eternal vigilance and application.

Welch, W. Va. J. W. POWELL

Urges Jim and Mac to Get On the Job and Clean Up

IF repair costs are going up for Jim and Mac at this time they themselves must be to blame. Either they are running a mine that was kept in good shape by somebody else before they took hold of it or they have been running a new mine and not taken the proper care of it. Otherwise these costs would not be climbing up and up.

I would advise Jim and Mac to look over the haulage roads and have them cleaned. They will be surprised how many ties are rotten, how many joints are low and loose, how many bonds are loose or missing and how the main haulage road is out of line. I would have the haulage roads repaired and lined and all loose and missing bonds welded.

The motorman, machine runner and pumper should be given a report blank furnished for that purpose by the company. At the end of the day's run the motorman should be required to state in his report any unusual condition in his locomotive as well as defects noted on the haulage roads. The report should be handed to the master mechanic by the mine foreman. After the locomotive has been repaired the report blank should be handed back with an O. K. to the mine foreman or superintendent.

The machine runner should make a report at the end of each shift about the condition of his machine—whether it is working properly or needs going over. The pumper should indicate in his report the time it took each pump to remove the water, how the motors behaved, how many pumps had hot or loose bearings and the condition of pipe lines. If conditions permit, the pumping and cutting of coal should be done at night, thus reducing the power bill.

If the mine is small and has no extra locomotives, instead of putting two men on at night to look after this equipment I would have one on the day shift and one on the night shift. If the locomotive breaks down the motorman and spragger can assist the day repairman, leaving the night man to look after all motors in the barn, making repairs and replacements of worn and needed parts.

In the case of a large mine there would have to be a machine boss, whose duty it would be to go into the mine and look after the machines while they are at work. It would be necessary for him to carry tools and minor parts to make repairs. The motor boss or motor repairman should act in like capacity with the locomotives. Each motorman, however, should be supplied with pliers, file, screwdriver and most needed controller parts—very few motormen are unable to repair the controller if they have the necessary tools and parts. They would, of course, be responsible for the tools.

Jim, Mac and Tom seem to have been sleeping on the job, or repair costs would not be steadily going up. JOHN BOHN,

Hooversville, Pa. *Mine Foreman*

Adequate Power Requisite For Efficient Machinery

WHERE mine equipment is operated under normal conditions I believe that breakdowns can be practically eliminated by regular inspections and prompt attention to minor defects. By this I mean that such equipment as stationary motors, locomotive motors, mining machine motors, etc., operating under low voltage due to line drops, inefficient plant generating capacity and other conditions working against the laws of electric currents will cause armature and field burnouts regardless of intervals of inspection, but the mechanical end of such equipment can be serviced in an efficient manner from time to time and kept in good mechanical condition.

Only reliable, intelligent workmen having a thorough knowledge of the machinery they are to handle should be allowed to operate such apparatus and constant attention should be exercised to see that the machines are supplied with sufficient power to operate them efficiently according to the manufacturer's rating. It is important, however, that the equipment be serviced at regular intervals by a competent mechanic.

Large organizations have an advantage over smaller companies in the selection and maintenance of equipment through being financially able to employ specialists for every branch of engineering connected with getting out coal. These technically trained men are able to effect lower operating costs than their less favored competitors. Organization discipline is the main consideration in getting away from red tape methods, which always are an obstacle to successful operation.

C. T. GRIMM,
General Superintendent.
Buckhannon River Coal Co.
Adrian, W. Va.

Successful Mine Officials Don't Override Their Men

ONE study that mine officials must make these days if they want to be successful is how to handle men. In the non-union fields especially nothing will organize the employees quicker than to override the men. This can be done in many ways.

In the old days there were times that though the men were satisfied officials of the union would start driving for something more drastic to keep this class of workmen dissatisfied. In many parts of Pennsylvania the union has been forsaken, and in some cases the men are contented. But I have made many inquiries and some investigations, and I find that the operators themselves are trying to organize the miners? Why? Because the mine officials in many instances are overriding the men by not recognizing them; not paying them for their deadwork, as before, or are not recognizing their complaints and short-weighting them to extremes.

These complaints are not the fault of the operators but of the officials under them. These officials should exercise all the discipline now that they used when the union was at its strongest. They should meet all the complaints of employees; pay them for their deadwork; meet them half way on all their grievances and not take advantage by shortweighting. Use courtesy with your employees; do not take advantage of them just because they are non-union—if you want to keep non-union.

If you want to see your employees organized I known no better way than to override them. There's an old saying that you can lead a horse to water, but you can't make him drink. It's the same way in this case; you may be able to override you men for a while, but you can't stop them from organizing. Sooner or later they get in on you. Men will stand for only so much, and there is an end to all things.

FAIR PLAY,
Central Pennsylvania *Mine Foreman.*

Waiting Until "Repair Day" Proves Expensive Practice

PROPER supervision and regular inspection of machinery and equipment by a competent man will greatly reduce repair costs and at the same time promote safety and economical operation. The man should be technically trained and of sufficient experience to direct the use and care of the equipment, so that needed repairs will be properly made. This will reduce delays and breakdowns to a minimum.

Regular inspections should be made for mechanical defects such as loose rivets or brakes, broken bolts, worn bearings, slipped, broken or worn keys and gears, broken and worn belt parts. The periodical "once over" should be directed also to such electrical details as poor insulation, grounds, splices (where made), commutators, brushes, the proper hanging of wire to prevent shorts and grounds, and making sure that the wire or cable is large enough to carry all the current required without undue heating or loss.

It should be remembered that defects in one part of a machine or locomotive soon cause trouble elsewhere; that a bad mine car soon causes more bad cars by wrecks and also usually is the cause of bad track and switches. The importance of remedying defects promptly was shown in drastic fashion in a mine I know of. A repair job that would cost $35 was known to be needed on a hoisting engine at a shaft mine, but it was delayed until the next repair day. Before the repair day came, however, the tooth on the pinion that was cracked gave way and let a cage drop about 70 ft. The cost for repairs was $800, and the company got off lightly at that, as the "accident" happened during working hours and a car of coal was on the cage instead of men.

Daily reports on the condition and work done by equipment should be made out by the men using it. Copies of these reports should be given the head repairman, foreman and superintendent, which will enable each to check the repairs needed, service rendered and probably be the means of

suggesting some method whereby efficiency can be increased.

In making a time allowance for inspections consideration should be given to the amount of work done by a piece of equipment and the conditions under which it has been operating. All inspections should be made by the repairmen under the supervision of the master mechanic. Many companies spend large sums of money replacing old machinery with new simply because their maintenance departments lack supervisors who systematically give the equipment the attention requisite to give the desired results.

Wolfpit, Ky. H. T. WALTON

Engaging Efficient Help Prevents Many Breakdowns

HOW to cut repair costs is a problem that confronts every mine superintendent and operator in this day of keen competition in the coal business, and as such should receive the serious consideration of all mine officials and persons who operate or look after machinery in and about the mines. Therefore any person employed to operate or care for motors or machines of any kind should be impressed with the value of the equipment to be placed in his charge and the consequent weight of his responsibility.

The mine electrician should instruct a new machine operative as to the load limits to be placed on any motor or machine, proper care, oiling, etc. The novice also should be directed to make regular reports at stated periods on the condition of machines in his charge and special reports in cases needing immediate attention.

The use of heavy wires and other makeshifts instead of fuses should be punished by dismissal. About 80 per cent of the expenditures for repairs can be saved by the employment of the right kind of men to handle machinery about the mines—men who not only *know* how but *will* take the proper care of machinery placed in their charge.

Mine foremen, assistants and firebosses should co-operate with the electrician in seeing that his instructions are carried out. Any employee sent to the mine foreman by the electrician as unsatisfactory, if not dismissed, should not be placed in charge of any machinery. Prompt report on any machinery out of repair should be made to the mine foreman in order that he may arrange his working forces accordingly.

A mine foreman cannot know too much about electrical equipment; although he may not be required to use his knowledge at a large mine, at a small operation where no electrician is employed he may have to look after the electrical work along with his other duties.

Masontown, Pa. ERNEST KRAUSE

Average Mine Foreman Lacks Knowledge to Boss Machinery

IT is apparent that Mac is in the same position as the average mine boss. That is, he wants to boss the electrical and mechanical work, yet doesn't know a circular mill from an ampere. The master mechanic or chief electrician should be in full charge of all mechanical equipment. He also should have authority to remove from duty any employee operating machinery if he is incompetent.

At the end of each shift the mine electrician should have all locomotives put over the pit, remove the covers and thoroughly inspect all working parts. Any adjustments or repairs needed should be made and all parts well lubricated before the locomotives go out on a new shift. In addition to making regular inspections of machines and pumps the mine electrician should never fail to commend an operative whose machine shows good care.

Constant supervision should be exercised to see that bonding is well done and that the feeder lines are heavy enough to carry a sufficient quantity of current. Careful adherence to this plan will curtail expenditures for supplies and repairs, besides keeping down delays during working shifts.

Each locomotive and machine should have a job number, and all repairs, parts and time consumed in remedying defects should be charged against this number. Such an arrangement would be all the report necessary for the master mechanic and superintendent. Each number also should be credited with the amount of work performed, which would enable the officials to know the capability of each operative.

I am also in favor of a bonus system by which a monthly award would be made to the motorman or machine operative having the least expense for oil and repairs per car or ton of coal produced.

Vivian, W. Va. C. E. LIVELY

Careful Inspection May Turn Lagging Mine Into a Success

EVERYTHING connected with a coal mine, inside and out, should be subject to frequent inspection by some qualified man and a check inspection should be made occasionally by some one off the job and reporting direct to the highest operating official. Dwellings and other mine buildings, mechanical equipment and mine workings should be so treated.

Failure to do this is at times the direct cause of a mine dragging along, just able to get by. I experienced this condition when I took charge of a mechanically operated mine; large in size but small in production. I soon learned that most of the trouble was in the mechanical-electrical department. These men were the most tired looking bunch I have ever seen. Very seldom were they seen in anything but their mining clothes and they were always extremely dirty. The mine was producing 450 tons a day and it was common to see the miners coming home at 7 p.m., and occasionally the tipple dump coal until 9 p.m.

The first step was to place both departments under one man and then bring about a better understanding between them and the inside bosses. All machinery was examined daily—while in operation whenever possible. This did not require special men but it did require examination by a qualified person and a report.

The mine pumps and chain machines in a section were taken care of by wiremen and bondmen. Under the new plan they would, when passing a pump in the morning, stop and examine it and write down the date. If anything was not working right they either repaired or reported it. This gave the mechanical department extra eyes all over the mine.

The tipple boss was made responsible for a report of all tipple machinery. The man in charge of track in a section was not allowed to pass a main-line switch without turning the throw-over to see how it was working. He also was made responsible for the automatic trapdoors in his section. No new men were employed; the plan gave the man in charge a chance to use all men to the best advantage; efficiency increased; overtime was practically eliminated.

This same thought was carried into every department and at the end of seven months the mine had increased its output nearly 400 per cent. Seldom was a miner seen coming from the shaft after 4 p.m. This inspection plan costs nothing and was one of the real causes of getting the mechanical department and the mine out of the slough.

Welch, W. Va. GEORGE EDWARDS

Co-operation by All Hands Will Reduce Heavy Outlay

ALTHOUGH a certain amount of repair costs is unavoidable, large repair bills oftentimes can be avoided by having all machinery regularly inspected and defective parts repaired before they reach the point where expensive replacements are a necessity. Incidentally this may avert the annoyance of listening to the Old Man raise Cain.

It is the duty of the electrician to see that all motors and machinery are sufficiently lubricated at all times. If he finds that the operatives of different machinery are not paying sufficient attention to this requirement he should report the matter to both the mine foreman and the superintendent, so that they can take steps to remedy the situation.

Rather than make a general overhaul once a year I believe in keeping all machinery in first class condition at all times. I have found it better to make repairs as we go along and not trust to "some time in the future." This, of course, requires a certain amount of inspection all the time, but it keeps our machinery in first class shape at all times and means that we have very few lost working hours when we are supposed to be running.

Co-operation between electrician, mine foreman, superintendent and the operatives of various pieces of machinery is the important thing. If you can get that you have solved the problem of eliminating high repair costs.

IVAN J. ELY,
Superintendent.
Cabin Creek Consolidated Coal Co.
Acme, W. Va.

Wear on Ropes Reduced By Regular Lubrication

SYSTEMATIC lubrication of all guide pulleys, idler pulleys, etc., on ropeways greatly reduces the wear on ropes. Where ball or roller bearings are used on these pulleys proper maintenance is necessary to obtain satisfactory results.

Plain spindles should be lubricated daily with ordinary bearing oil, and particular care should be taken where they are situated in exposed places. If they are allowed to get overheated the result is serious, as they become stiff and impose considerable strain on the ropes as they pass around them. If the overheating is extreme, then the whole pulley will be affected and this may cause serious damage to the ropes. The faulty performance of either a ropeway or a rope drive often may be traced to stiffly working guide or idler pulleys.

Ropes also require lubricating; when located where they are subjected to moisture a waterproofing composition should be used. Efficient compositions for treating ropes may be obtained from the rope makers; the use of home-made preparations should be avoided except in emergency.

Brentford, England W. E. WARNER

WORD *from the* FIELD

Johnson Urges Inquiry In Strike Field

A thorough investigation of conditions existing in the soft coal fields of central Pennsylvania, western Pennsylvania, West Virginia and Ohio was proposed in a resolution introduced in the Senate at Washington Jan. 9 by Senator Johnson of California. Senator Johnson's resolution, which has the backing of officials of the United Mine Workers, also contains the following specific provisions:

"To ascertain whether the railroad companies and their officials have been or are, by agreement or otherwise, endeavoring to depress the labor cost of coal produced by union labor; also whether in the said coal fields wage contracts have been abrogated or repudiated; whether defenceless men, women and children, without cause, have been evicted from their homes, and generally what has transpired in the said coal fields, and the reasons for conditions and happenings therein. In this connection the said committee [Senate Committee on Interstate Commerce] shall ascertain whether in industrial disputes or strikes in said coal fields injunctions have been issued in violation of constitutional rights, and whether by injunction or otherwise, the rights granted by the Constitution of the United States have been abrogated and denied."

Identical bills presented in the Senate and House on Jan. 4 by Senator Copeland and Representative Jacobstein of New York proposed that the operation of the anti-trust law be suspended so far as it relates to the soft-coal industry, so that the mines could combine and function co-operatively.

Breaks Hoisting Record

All hoisting records for central Illinois were broken during the week ended Dec. 10 at No. 10 mine of the Indiana & Illinois Coal Corporation, Nokomis. In one 8-hour day 1,990 pit cars loaded with coal, a total of 6,647 tons, were hoisted to the surface, weighed and dumped into 120 railroad cars—an average of nearly 14 tons a minute. More than 1,000 men are employed at the No. 10 shaft.

Plans New Power Plant

The Gulf States Steel Co., it is reported, will construct a large power plant at its Gadsden (Ala.) works, at which are located its blast furnaces, steel and wire mills and byproduct coke plants.

COAL AGE was founded in 1911 by the Hill Publishing Co. In 1915 *Colliery Engineer*, with which *Mines and Minerals* previously had been consolidated, was absorbed by COAL AGE.

When, in 1917, the Hill Publishing Co. and the McGraw Publishing Co. were consolidated to form the present McGraw-Hill Publishing Co., COAL AGE became a member of this larger publishing enterprise. On July 1, 1927, the journal was changed from a weekly to a monthly.

During sixteen years the editorship has been held successively by Floyd W. Parsons, R. Dawson Hall, C. E. Lesher and John M. Carmody. The editorial staff of COAL AGE consists of: John M. Carmody, Sydney A. Hale, R. Dawson Hall, A. F. Brosky, J. H. Edwards and Louis C. McCarthy.

Davis Advocates Czar For Coal Industry

Efforts by James J. Davis, Secretary of Labor, to bring about "peace in the bituminous industry by Christmas" not only failed of their objective on schedule but the factions still at odds seem as far apart as ever. With all the large operators unrepresented, Secretary Davis' conferences, held in Washington Dec. 13-15, developed the suggestion of one way out—legislation by Congress. The other way, according to the Labor Secretary, "is for the leaders in the coal industry to submit the industry to control by an umpire or overlord. If they did so, they would bring about order and stabilization at a stroke." He suggests a man "of the type of Charles E. Hughes."

The conference of operators and miners was called in response to a suggestion made to President Coolidge by a delegation of labor representatives headed by William Green, president of the American Federation of Labor, and John L. Lewis, president of the United Mine Workers. President Coolidge referred the matter to Secretary Davis. Telegrams sent out Dec. 9 announcing the conference would be held in Washington Dec. 13-15 met with refusals to take part from the large producers. Only a scattering of small producers from the regions affected—central and western Pennsylvania, Ohio and northern West Virginia—was represented, and the names of these were withheld.

After conferring with the miners and operators separately Secretary Davis met them jointly. He then appointed a committee of three operators and three representatives of the union to consider the coal situation and to report back to him. This committee, after sessions lasting nearly three days, failed to reach a conclusion and recessed Dec. 15 subject to call for further conferences with Secretary Davis on any date he might decide upon or with authority to hold sessions on its own account.

In the meantime the individuals composing the committee were requested by Secretary Davis to file with him from time to time reports or suggestions regarding the situation. Numerous plans and suggestions from miners and operators have been coming to the Labor Department since the conference adjourned, it is stated, but the department has not divulged any of them.

Illinois Blast Kills 21

An explosion in mine No. 18 of the Industrial Coal Co., West Frankfort, Ill., on Jan. 9, killed 21 miners. The blast occurred at 8 a.m., soon after 600 men had entered the mine to start work. About 100 men were in the section affected by the explosion, of whom eight escaped uninjured. The explosion is thought to have been due to the ignition of gas, though A. D. Lewis, director of the State Department of Mines and Minerals, who was investigating, had made no statement when this issue went to press.

To Open Strip Mine

Charles L. Runyan, Petersburg, Ind., has purchased more than 200 acres of coal land just west of Clark's station, three miles southwest of Petersburg, and will open a stripping operation on the land as soon as railroad switches can be built and equipment installed. This is the first strip mine to be opened in Pike County west of the Evansville & Indianapolis R.R.

Coupon Plant Reopens

Sale of the mines and property of the Altoona Coal & Coke Co., located at Coupon, Cambria County, west of Altoona, Pa., has resulted in the resumption of operations on a non-union basis. O. C. Burtner, of Philadelphia, pur-

chased the plant from John Lloyd, president of the First National Bank of Altoona, and Thomas L. Jones, who was manager in charge of operations. The property, which formerly was operated on a union basis, had been closed down during the summer and fall because unable to operate at a profit under the union scale.

Coming Meetings

Monongahela Coal Operators' Association. Annual meeting Jan. 12, 1928, at Morgantown, W. Va. Secretary, D. H. Pape, Morgantown, W. Va.

New England Wholesale Coal Association. Annual meeting, Jan. 16 at Algonquin Club, Boston, Mass. Secretary, Robert Gilmore, Boston, Mass.

Engineers' Society of Western Pennsylvania. Annual meeting in the Blue Room, William Penn Hotel, Pittsburgh, Pa., Jan. 17, 1928. Secretary, K. F. Treschow, Pittsburgh, Pa.

American Society of Heating and Ventilating Engineers. Annual meeting, Jan. 23-26, at Hotel Pennsylvania, New York City. Secretary, A. V. Hutchinson, 29 West 39th St., New York City.

American Wood Preservers' Association. Annual meeting at Montreal, Canada, Jan 24-26, 1928. Secretary, E. J. Stocking, Chicago, Ill.

Northeast Kentucky Coal Association. Annual meeting, Jan. 26, at Ashland, Ky. Secretary, C. J. Neekamp, Ashland, Ky.

Coal Club of Philadelphia. Annual meeting and dinner Jan. 28, 1928, at the Bellevue - Stratford, Philadelphia, Pa. Secretary, Charles H. Scull, Philadelphia.

Hazard Coal Operators' Exchange. Annual meeting, Feb. 10, Phoenix Hotel, Lexington, Ky. Secretary, J. E. Johnson, Lexington, Ky.

Eastern Ohio Coal Operators' Association. Annual meeting, Feb. 13, at Cleveland, Ohio. Secretary, D. F. Hurd, Chester-12th Bldg., Cleveland, Ohio.

Midwest Power Conference. Feb. 14-17, Chicago. Secretary, G. E. Pfisterer, 53 W. Jackson Boulevard, Chicago.

American Institute of Mining and Metallurgical Engineers. Annual meeting, Feb. 20-23, at Engineering Societies Building, 29 West 39th St., New York City. Secretary, H. Foster Bain, 29 West 39th St., New York City.

The Rocky Mountain Coal Mining Institute. Winter meeting, Feb. 27-29, at the Cosmopolitan Hotel, Denver, Colo. Secretary, Benedict Shubart, Denver, Colo.

New England Coal Dealers' Association. Annual convention, April 4-5, Horticultural Hall, Boston, Mass. Secretary, C. R. Elder, 141 Milk St., Boston, Mass.

Operating Problems Absorb Annual Meeting Of Coal Mining Institute of America

DISCUSSION at the forty-first annual meeting of the Coal Mining Institute of America, held in Pittsburgh, Pa., on Dec. 7 and 8, dealt with a wide range of coal-mining problems, most controversial being questions arising from a consideration of subsidence and ground movements incident to the mining of coal.

C. R. Claghorn, consulting engineer, of Baltimore, Md., suggested for consideration the compiling of all information and data on the subject from the technical press and records of mining societies and institutes. Another praiseworthy undertaking was the appointment of a committee to co-operate with the Bureau of Mines in its investigation of accidents from falls of roof and coal.

Officers elected to serve during 1928 are: President, W. H. Howarth, Brownsville, Pa.; first vice-president, William Nisbet, Greensburg, Pa.; second vice-president, George W. Riggs, Uniontown, Pa., and third vice-president, James D. Walker, Butler, Pa. The office of secretary-treasurer will again be filled by H. D. Mason, Jr., of Ebensburg, Pa.

G. W. Grove, associate engineer of the U. S. Bureau of Mines, described the activities of the vocational or practical mining school of the Stag Canyon branch of the Phelps-Dodge Corporation, at Dawson, N. M., where inexperienced men are taught the rudiments of mining, while actually earning a living, in a section of the mine set apart for the purpose. In nine months the school produced 30,000 tons of coal with only one lost-time accident.

Rush N. Hosler, superintendent of the Pennsylvania Rating Bureau, said he was glad to hear that this coal company recognized the importance of goggles as protection from eye accidents. The lowering of visibility by their use might retard the introduction of goggles, he said; but this might be corrected by installing a stationary light in the working place, as is done so successfully in the mines of the United States Coal & Coke Co.

Thomas A. Mather, state mine inspector, Tyrone, Pa., asserted that room workings are not suitable for loading machinery; that longwall is better. But Edwin Johnson, of the Coloder Co., Columbus, Ohio, differed with him, saying it would be wrong fundamentally to set aside a system entirely understood and to adopt a new one, thus adding to the difficulties already at hand. He added that it is easier to design a machine to suit conditions than to alter conditions to match a machine.

H. N. Eavenson opined that little progress will be made in machine loading if the industry waits for the development of new methods of mining. His observations are that longwall cannot compete with present methods in this country at this time. Defending the possibilities of mechanizing a room-and-pillar mine, Frank Dunbar, general superintendent of the Hillman Coal & Coke Co., pointed to an increase in efficiency at one mine from 2,000 tons daily by 405 men hand loading to 1,800 tons by 207 men machine loading.

W. L. Affelder, assistant to the president, Hillman Coal & Coke Co., remarked that conveyors in room-and-pillar workings in one mine of his company are so successful that the operating department doesn't have to go to the board of directors for authorization of expenditures for additional units.

John F. Bell, state mine inspector, Dravosburg, Pa., read a paper on "Flame Safety Lamps." He stated that an electric cap lamp or a flashlight should not be carried with the flame safety lamp, whose flame cannot be accurately observed in the presence of light from the other.

Because the gasoline now being offered is a blended product and not a pure distillate, in a flame safety lamp it causes a fuel cap which constantly changes, said John T. Ryan. Therefore the fuel cap should be observed in fresh air at frequent intervals during a shift and any change noted. Acetylene should never be used as the combustible gas in a chamber for testing a flame safety lamp, for, as pointed out by A. C. Callen, under such conditions acetylene has been ignited by a lamp in good adjustment.

On the question "Should rescue apparatus be used for training an indefinite number of men, or kept for the exclusive use of the permanent rescue team?" it was the joint opinion of J. V. Berry, safety engineer of the Bethlehem Mines Corporation, and George S. McCaa, of the U. S. Bureau of Mines, that all such equipment should be kept continually in use for training purposes.

IN AN emergency the men have confidence in equipment which they are accustomed to. But should several men make common use of one outfit, each ought to be provided with a few parts for individual use—a mouthpiece, for instance.

Concerning the question "To what extent is it necessary to prohibit the use of black powder in bituminous coal mines?" B. L. Lubelsky, explosives engineer of the Pittsburgh Coal Co., said that permissible explosives are not only safer but when properly handled will produce a quality of coal equal to that gotten from black powder and at no great difference in cost.

As the principal speaker at the banquet, Jerome C. White, planning engineer of the Pittsburgh Coal Co., talked on scientific management. It is not true, he said, that a coal mine is less susceptible to scientific methods in management than a factory. The problem of taking materials to and from machines is common to both.

Tools and machines adequate for their intended duty have been developed by

the manufacturer; limitations of mine layouts are known to the mining engineer; all that remains for genuine accomplishment is co-ordination of the various phases of operation.

The second day of the meeting opened with a paper on "Explosion-Tested Reel Locomotives," by W. D. Turnbull, of the Westinghouse Electric & Mfg. Co. This paper described the design and construction of these locomotives, which for gathering purposes in Eastern bituminous mines have won the popular approval of operating men. R. C. Beerbower, of the Goodman Manufacturing Co., said this type was first developed for use in the Nemacolin mine of the Buckeye Coal Co. This company feels that it is safer than the storage-battery locomotive and he believes that it is the most satisfactory yet produced for gathering. T. G. Fear, general manager, Consolidation Coal Co., spoke a few words in its favor. Its totally inclosed features stop the motormen from tinkering inadvertently with its mechanism and also keep out sand and dust.

W. H. Howarth outlined the conclusions of an inspectors' commission upon investigating an installation of these locomotives: From the standpoint of safety this locomotive is safer than the government-approved cutting machine in that it doesn't go close to the face and stays in a room for only a short time.

To the question "Does it pay to rock-dust non-gaseous mines?" Mr. Dunbar answered that all bituminous mines should be so treated as none is definitely known to be non-gassy. Mr. Affelder said that the experience of his company has been that rock dust tends to minimize the number of falls on main entries in the summer months. Mr. Fear said the Consolidation Coal Co. has commenced to rock-dust its open-light mines in the Pittsburgh seam.

"Is an arcwall machine for top cutting as safe as other machines for cutting in the middle or bottom in gaseous mines?" constituted the sixth query in the question box. Charles Byrne, state mine inspector, Charleroi, Pa., remarked that the electrical features of this machine were every bit as safe as those of any other cutting machine, but that the conditions under which it worked were more dangerous—falling coal dust and operation of the cutter bar at the roof where gas will accumulate if present.

A question arose as to the danger in gas of sparks from the topcutter. Mr. Beerbower thought the likelihood of such action remote and added that spraying of water on the cutter bar would eliminate the danger of dust ignition.

Is rock dust a practical agent for extinguishing mine fires? J. T. Ryan said that when water is directed on a coal fire a miniature gas producer is formed which chiefly gives off hydrogen. In a normal mine-fire atmosphere ignition of gas cannot occur in the presence of less than 12 per cent oxygen, but the presence of hydrogen may lower this limit to 5 per cent of oxygen.

John Jones ("Rock-Dust Johnny"), safety engineer of the Old Ben Coal Corporation, told how rock dust was used in an Illinois mine to extinguish a fire of such proportions that three railroad cars of coke and cinders were afterward loaded out from the fire area. Within the limits of practicability of application, he said, the effectiveness of rock dust as an extinguisher is unapproached by any other agent for, as Harry Howarth, of the U. S. Bureau of Mines, declared, "It stays put."

The last paper of the meeting, entitled "Some Data on Subsidence and Underground Earth Movements Incident to Coal Mining," was read by H. N. Eavenson in the absence of its author, Clarence Claghorn, consulting engineer, Baltimore, Md. Mr. Claghorn said that most of the views developed in this country relative to roof action are based chiefly upon observations on the surface.

Mr. Eavenson said that observations so far in this country show subsidence over only worked-out areas, whereas in Great Britain it may be observed over coal adjacent to goaf. Mr. Affelder said that it is always well in making up a deed for the sale of reservation coal under a property to have the buyer waive all damages to surface from mining of coal adjacent to that property.

It is thought by some that little subsidence of the surface results from the extraction of a seam of coal at great depth. Yet Mr. Eavenson described conditions in a case in Great Britain where surface subsidence amounted to the equivalent of 40 per cent of the thickness of the seam. W. H. Howarth thought this due to the settling of the cover as a body, without much breaking. But L. E. Young, operating vice-president of the Pittsburgh Coal Co., took the stand that in all cases where sufficient coal is extracted the strata are more or less seriously affected. (Whether the cover was shattered or merely fractured was the bone of contention.)

Louis F. Gerdetz, consulting engineer, Lonaconing, Md., said that in advancing longwall the draw may sometimes be ahead and sometimes back, depending upon conditions, but in general it will be over the gob. The strength of the strata is one factor; continuity of operation is another. If a face is stopped for a month or two the draw will gain and may eventually extend over the coal.

A question that elicited considerable discussion was "Would it be advisable to employ three 8-hr. shifts in coal mines?"

Mr. Maize said that a certain mine in his district is being triple-shifted fairly successfully, the purpose being to cut down the overhead, which otherwise would be large because the territory unmined is comparatively small and on the retreat.

Mr. Gerdetz said that the Sonny mine of the Georges Creek Coal Mining Co., Lonaconing, Md., is double-shifted on the long faces and triple-shifted on development work. This is essential in this case for quick recovery of abandoned pillars in caved territory.

The question "Which is the best lubricant for mine-car wheels and machinery, oil or grease?" drew forth a lively discussion. Mr. Affelder presented the accompanying table which compares the respective costs of oil and grease for four mines of the Hillman Coal & Coke Co. He explained that the comparison as indicated by this table cannot be considered exact because of a difference in conditions.

Mine	Lubricant	Tonnage	Lubricant Cost, Cents per Ton	Labor Cost, Cents per Ton	Total Cost, Centsn per To
A	Grease	367,000	0.68	0.27	0.95
B	Grease	178,000	0.39	0.33	0.72
C	Grease	400,000	0.65	0.26	0.91
D	Oil	449,000	0.29	0.36	0.65

Comparing Cost of Oil and Grease on Mine Car Wheels

W. D. Hockensmith, vice-president, Hockensmith Wheel & Mine Car Co., Penn, Pa., declared that a heavy grease is not a lubricant in that it doesn't reach the surfaces in need of it. A plain bearing wheel properly lubricated with a good grade of oil will last nine to eleven years without showing appreciable wear in the bore.

"What are the advantages and disadvantages (if any) of driving rooms on the butts both for advance and retreat?" In answer to this question Inspector Byrne said this system sometimes improves roof conditions. T. M. Zimmerman, chief engineer of the Washington Coal & Coke Co., Star Junction, Pa., described the layout of the mine of his company, which is projected in accordance with this system exclusively.

The mine is in the Pittsburgh seam, which pitches as much as 9 per cent in a direction parallel to the face cleats of the coal. The butt-room layout therefore provides flat room entries and natural drainage. The rooms are driven narrow on wide centers and the pillars are mined by face places or cuts. By this arrangement only 30 to 35 per cent of the coal is mined on the butt and more lump coal is produced than would have been the case had the layout been in accordance with customary practice.

Buys Wayne Strip Land

The Big Bend Coal Co., which operates clay and coal pits near Center Point, not far from Brazil, Ind., has bought 328 acres of coal stripping land in Clay and Owen counties, Indiana, southeast of Brazil. The property was offered for sale by Walter A. Jones, special master in bankruptcy in the federal court at Columbus, Ohio, in settlement of the affairs of the Wayne Coal Co., which was in bankruptcy. The Big Bend company purchased the lands at $100 an acre, paying $32,888, which is much less than the former owner paid for it.

New Liquid Oxygen Plant

Liquid oxygen, manufactured and used as an explosive at the strip operation of the Enos Coal Co. near Oakland City, Ind., has been so successful that another oxygen-producing unit has been purchased and will be installed in a short time, it was announced early in December.

Washington Letter

By Paul Wooton
Special Correspondent

SECRETARY DAVIS' pronouncement of Dec. 16 on the occasion of the adjournment of his rump coal conference partook of the characteristics of a funeral oration. Like others who have grappled with the coal problem he consoles himself with the thought that "if this conference accomplishes nothing else it has served to focus public attention." Whatever may have been the amount of public attention attracted no one is disposed to dispute that the conference accomplished nothing else.

The suggestion thrown out by Secretary Davis that the coal industry establish an umpire or overlord is reminiscent of Judge Landis and Will Hays.

The position taken by the President in his message has since been amplified at the White House. It was explained that the President did not mean that Congress should provide for continuous supervision of coal such as is exercised by the Interstate Commerce Commission over the railroads. All he is asking, it was explained, is emergency powers to distribute coal during a crisis and to have provision made for special mediation in labor disputes as they arise.

Some correspondents take the view that the President is not likely to do any insisting that the recommendation be complied with as it transfers to Congress the political consequences of the present strike. He perhaps will not be disappointed if the burden reposes indefinitely on Capitol Hill.

There has been some suspicion in certain quarters in the coal industry that the Bureau of Mines has harbored a desire to have some supervisory powers over coal. It can be stated from first-hand knowledge, however, that the feeling in the Bureau is that the assumption of any regulatory powers would conflict with its primary functions of safety education and scientific work. Should Congress decide regulatory legislation is desirable the probabilities all are that the Bureau would recommend that such powers be vested in some other agency.

In the past bills have been introduced naming the Bureau of Mines as the agency to handle various regulatory proposals. No such bill ever has been given the Bureau's endorsement, but as they never were considered even in committee, no opportunity has been afforded for officials of the Bureau to express themselves concerning these proposals.

As a result there has been some opposition in the coal industry to co-operation with the Bureau. The feeling, however, is based on a misunderstanding as the Bureau simply is trying to follow the line of endeavor indicated in its organic act and is just as anxious to avoid the assumption of regulatory duties as the coal industry is anxious that it be avoided. As a matter of fact safety work, fuel analysis, testing of explosives, testing of equipment for permissibility, statistical work, economic work and market services all are activities based on voluntary co-operation between the Bureau and industry. In the conduct of this work the Bureau has no powers of compulsion and it seeks none.

Cosgrove Made Receiver

The U. S. District Court at Charleston, W. Va., appointed receivers for the West Virginia Coal & Coke Co. Dec. 2 in a friendly action designed to effect reorganization of the company. Judge McClintic named John C. Cosgrove, Johnstown, Pa., president of the company; Gohen C. Arnold, former president of the State Senate, and Lee Ott, former State Compensation Commissioner, as receivers to operate the company's properties in the Logan, Kanawha, Elkins and Fairmont fields.

Charter Nyco Coal Co.

Papers have been filed with the Secretary of State at Columbus, Ohio, chartering the Nyco Coal Co., with an authorized capital of 1,000 shares of stock, no par value, to buy, lease, own, hold and operate coal properties. The incorporators are C. W. Thompson, George W. Quillin and A. L. Thompson, all of whom are connected with the New York Coal Co., of Columbus. The property to be taken over is located on Horse Creek in West Virginia.

Bunting Dies Suddenly

Douglas Bunting, vice-president and general manager of the Lehigh & Wilkes-Barre Coal Co., Wilkes-Barre, Pa., died Dec. 15 following an intestinal operation. Mr. Bunting, who was 57 years old, had been connected with the Lehigh & Wilkes-Barre company since 1894, becoming vice-president and general manager in 1924. He also was a director of the company as well as of the Morris Run Coal Mining Co. For a short time after his graduation from Cornell, in 1891, he was in the employ of the Mount Jessup Coal Co., Scranton.

Powellton Tipple Burns

The tipple and part of the conveyor line of the Powellton mine, at Powellton, W. Va., in the Fayette County field, were destroyed by fire about 2 a.m., Dec. 6, entailing a loss of approximately $100,000.

Large Operators Merge

Two of the largest coal companies in central Pennsylvania, the Rochester & Pittsburgh Coal & Iron Co. and the Jefferson & Clearfield Coal & Iron Co., were merged at Brookville, Pa., during the first week in January under the name of the Rochester & Pittsburgh Coal Co.

Buys Large Coal Tract

A deal was consummated at Clarksburg, W. Va., early in December for the purchase of 2,000 acres of coal in the Pittsburgh seam by the Dola-Penn Coal Co. of Pittsburgh, Pa., which operates at Dola, W. Va. Although the consideration is not given, the tracts, sixty-one in all, are estimated to be worth approximately $1,000,000.

Otis S. Newton Dies

Otis Sherman Newton, vice president and general manager the Sunday Creek Coal Co., Columbus, Ohio, died Dec. 7 at White Cross Hospital, in that city, from complications following an attack of influenza which he suffered for about 10 days. He was 46 years old. His parents, his wife, two children, five brothers and one sister survive him.

Personal Notes

Robert J. Montgomery, vice-president, general sales manager and a director of the Philadelphia & Reading Coal & Iron Co., Philadelphia, Pa., announced early last month that he would retire from the active affairs of the company at the close of the year. He had been with the company 47 years. His resignation was said to be due to failing health.

W. A. Chandler, of Scranton, Pa., who recently resigned as consulting electrical engineer of the Delaware & Hudson interests, will leave soon for South America, where he will become an executive for the Standard Oil Co. in a development project. Later he will make his headquarters in New York City.

Everett Drennen announced on Dec. 7 in Charleston, W. Va., that he had tendered his resignation as president of the West Virginia Southern Coal Co. Mr. Drennen said he would devote his entire time to other business interests in which he has been engaged.

Anthracite Prices at New York for January

(Per Gross Ton, f. o. b. Mine)

	Broken	Egg	Stove	Chestnut	Pea	No. 1 Buckwheat	Rice	Barley	Birdseye
Lehigh Coal & Navigation	$8.75	$8.75	$9.25	$8.75	$6.00	$3.00	$2.25	.....	.....
Lehigh Valley Coal Sales Co.	8.50	8.75	9.25	8.75	6.00	3.25	2.25	$1.75	.....
Lehigh & Wilkes-Barre Coal Co.	8.75	8.75	9.25	8.75	6.00	3.25	2.00	1.50	.....
Hudson Coal Co.	8.75	8.75	9.25	8.75	6.50	3.25	.....	.....	$1.60
Phila. & Reading C. & Iron Co.	.....	8.75	9.25	8.75	6.00	3.25	2.25	.....	.....
D., L. & W. Coal Co.	8.25	8.75	9.25	8.75	6.00	*3.25	2.25	1.75	.....

* Domestic buckwheat, $3.75.

American Mining Congress Sizes Up Trends in the Industry

FROM the mining industry, said Secretary Hoover of the Department of Commerce, at the twentieth annual convention of the American Mining Congress, Washington, D. C., Dec. 1-3, five times as much revenue is obtained by federal taxation as is received from all the other raw-material industries in the United States including agriculture.

Furthermore, the prices of all the products of the mining industry have risen since the year 1913 less than the average of prices of the products of all industries. Anthracite and lead, however, are exceptions. They have risen in price 54 per cent. The price of bituminous coal, which has risen only 42 per cent, has not kept pace with the general rise. Evidently, said Secretary Hoover, there has been no profiteering in the mining industry.

At the morning meeting, at which H. Foster Bain, secretary, American Institute of Mining and Metallurgical Engineers, presided, Mr. Hoover remarked that the Department of Commerce was the only branch of the government enjoined by law to foster and develop the mining industry. The industry ships annually 6½ billions of dollars of product and after manufacture the product filters through to the consumer in various forms and sells for 20 billions, or a quarter of the whole national expenditure.

THE Department of Commerce receives less than $4,000,000 yearly, which, he said, is surely not an extravagant expenditure in view of the reduction of waste, the cheapening of production and distribution and the saving of life that is thereby effected. These return many thousand per cent on the money which is expended on them.

Sidney J. Jennings, vice-president, U. S. Smelting, Refining & Mining Co., said present conditions made the mining industry skim the cream of its deposits, leaving the skim milk behind. This is not a way that assures maximum conservation of our resources for future generations. In fact the nation is dispossessing itself of raw materials for the benefit of other nations.

It is well recognized that there is danger in being governed by slogans. Because co-operation between producers has been dubbed by a bad name is no reason why co-operation that serves the interest of the public and industry should not be permitted and encouraged.

R. V. Norris, consulting engineer, Wilkes-Barre, Pa., remarked that what was needed was the formation of three or four large corporations that would be large enough not to monopolize but to direct the coal industry. They would be able to employ the best grade of executive ability; they would close down the least profitable mines; they would mechanize properly.

At the luncheon which followed, Edward W. Parker, director, Anthracite Bureau of Information, Philadelphia, Pa., declared that the anthracite industry was not "sick." It had not been set back as badly as the bituminous industry. Its statistics showed that the tonnage produced in the present year had declined less than the bituminous output. He said that unseasonable weather had delayed buying and that so many purchasers of coal had bought automobiles and radios on installments that they had no money to finance their annual anthracite purchases but had to buy small lots to tide them through a month at a time.

A nominating committee was elected to suggest names for directors. This committee consisted of A. G. Mackenzie, R. Dawson Hall and J. H. Hand.

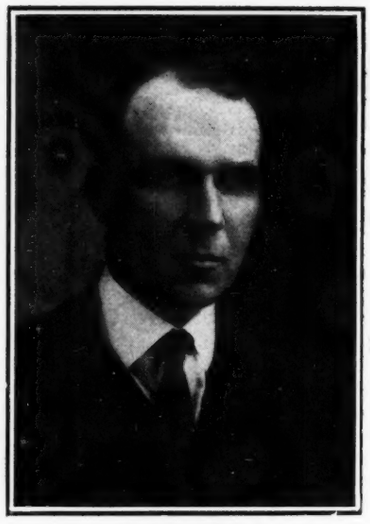
J. G. Bradley, president, Elk River Coal & Lumber Co., Dundon, W. Va., acted as chairman at the afternoon meeting and declared that Congress had too actively endeavored to put industry in leading strings. In Great Britain there had been a law for centuries that prevented a single organization or a few organizations from "engrossing" the whole product of any market so as to raise prices unduly. This law had not been used to oppress industry. It was so interpreted that any engrossment was permissible so long as it did not impose a burden on the consumer. The anti-trust law was altogether too inflexible.

Mr. Bradley said that despite the large sum spent on the Department of Agriculture the agricultural industry has landed in much trouble. The Bureau of Mines has always been economically administered, and he advocated a continuance of that policy.

SENATOR TASKER L. ODDIE, chairman, Mines and Mining Committee, U. S. Senate, declared that although the annual mining production amounts to six billions of dollars the Bureau of Mines appropriation is only $1,750,000 a year. Of this $750,000 is available for safety work and of this again only $225,000 is available in the mining field. There should be, he declared, at least one health and safety worker for each mineral-producing state, whereas at present there are only six for the entire activity.

The agricultural industry, with an annual product valued at twelve billion dollars, receives from the government, said Mr. Oddie, $128,000,000 annually, whereas the mineral industry, with an annual product worth six billion dollars and furnishing half the freight carried by the railroads, receives from the same source only $4,000,000 annually.

Senator Oddie said that were the death rate from falls of roof and coal reduced throughout the coal field as it had been in West Virginia during the intensive campaign lasting two months in which 35 lives were saved, more than 500 lives per year would be spared from this cause alone and 1,500 lives from all causes. Moreover many millions of dollars would be saved by the mining industry. Agriculture, added Mr. Oddie, was allowed $5,000,000 for economic research, and mining only $300,000.



J. G. Bradley

In the "Bureau of Mines Hour," Director Scott Turner and his division chiefs and section heads during a space of two hours gave a detailed account of their many activities.

New directors were elected at the close of this meeting. They were J. J. Robinson, Miami, Okla.; Jesse F. McDonald, Leadville, Colo.; J. B. Warriner, Lansford, Pa., and C. R. Crane, New York City. The directors whose terms expired were H. W. Seaman, Chicago, Ill.; Bulkeley Wells, San Francisco, Calif.; Sidney J. Jennings, New York City, and E. L. Doheny, Los Angeles, Calif.

On Friday morning Carl Scholz, general manager, Raleigh-Wyoming Coal Co., Charleston, W. Va., presided. Former Representative Philip P. Campbell, of Kansas, spoke on "Federal Control—The Bugaboo of Industry." Mr. Campbell declared that the officials in the bureau regulating the leasing act were scientists, and no one could rely on men of that temperament to exercise administrative supervision. He declared that many dormant possibilities were wasted under government leaseholding. A. Cressy Morrison, Union Carbide Co., New York City discussed the Geneva conference.

H. N. Taylor, president, United States Distributing Corporation, New York City, acted as chairman at the afternoon session of Friday, Dec. 2. Gilbert H. Montague, attorney, New York City, made an address on "Lawful Combinations in Industry," in which he said "Never in the history of the anti-trust laws has their interpretation by the Supreme Court and their administration by the government been so sympathetic as now to the present and future needs of American business."

Walter Gordon Merritt, counsel for the anthracite operators, referred to the anti-trust laws as encouraging rather than restricting liberty of action in the conduct of business, citing the celebrated "Danbury Hatters" case and the recent decision in the case of the Bedford Stone Co. as examples of the man-

ner in which the courts protected industrial liberty. The anti-trust laws do not prohibit associations of employers or employees, but they hold that the right to remain unorganized is as sacred as the right to organize. The laws cannot be amended merely to rectify conditions in the anthracite or bituminous industry. The amendment must be one conforming to general principles and applying to all business.

IT was announced that the board of directors had elected J. G. Bradley, Elk River Coal & Lumber Co., Dundon, W. Va., president of the Congress for the ensuing year, supported by R. E. Tally, Clarkdale, Ariz.; George B. Harrington, Chicago, Ill.; Jesse F. MacDonald, Leadville, Colo., as first, second and third vice-presidents, respectively. J. F. Callbreath continues as secretary. The executive committee will consist of Mr. Bradley, Archibald Douglas and S. J. Jennings.

In the technical section of this issue will be found a description of the meeting on the standardization of mining and loading equipment. The "Progress in Standardization" meeting on Friday morning, at which Colonel W. R. Roberts, president, Roberts & Schaefer Co., Chicago, presided, was devoted solely to questions regarding the status of the various codes passed, pending and being prepared. J. M. Hadley made his bow as the new secretary of the standardization division.

An "Internal Revenue Hour," conducted by S. P. Hatchett, chief, engineering division, Bureau of Internal Revenue, Washington, D. C., revealed the efforts being made to simplify taxation bills at least for 75 per cent of the taxpayers. Simplification for the 25 per cent that pay 95 per cent of the taxation is difficult because of the inherent complexity of the subject.

H. B. FERNALD, of Loomis, Suffern & Fernald, New York City, said that the taxpayer "does feel that he should have some more definite standard according to which he could prepare his return and swear to it; that when his return is filed it should be entitled to some credence; that additional taxes should be imposed only if the department can give definite reasons therefor and that he is entitled to a statement of these reasons; that decisions upon protests and hearings should be given by those who have heard the case. Furthermore, when, after due examination and hearing, a tax has been determined, this ought to be its final determination."

Income is largely a matter of opinion. In the long run any misinterpretation corrects itself. Perhaps, said Mr. Fernald, the government would do well to accept the showing on the books. It might cause a loss of revenue for a few years but eventually it would be returned.

At the afternoon meeting, presided over by Archibald Douglas, James E. Watson, Senator from Indiana, inveighed against the growing tendency toward centralization in government that so grievously reduces individual initiative.

George Otis Smith, director, U. S. Geological Survey, Washington, D. C., conducted a "Geological Survey Hour" with the aid of many of his chiefs.

New River Operators Elect Garvey

Harry L. Gandy, executive secretary of the National Coal Association, and Holly Stover, of Chicago, were the principal speakers at the annual meeting of the New River Coal Operators' Association held Dec. 6 at the White Oak County Club, Mount Hope, W. Va. There was a discussion of safety practices in the mines and new officers were elected.

M. L. Garvey, of Mount Hope, is the new president; R. E. Taggart of Big Stone Gap, Va., vice-president; P. M. Snyder, of Mount Hope, treasurer, and S. C. Higgins, secretary.

S. A. Scott and G. H. Caperton, in addition to the officers, have been chosen as members of the board of governors of the Smokeless Coal Operators' Association and William McKell and Ernest Chilson were elected as members of the executive committee of the West Virginia Coal Association.

New Strip Mine to Open Soon in Illinois

A large coal-stripping operation is to be opened in about two months at Wilmington, Ill., a few miles south of Joliet. The property to be worked comprises about 6,500 acres and is owned by the Northern Illinois Coal Corporation, of which Joseph E. Hitt is president. The new operation, according to Mr. Hitt, will have a daily output of approximately 3,000 tons, or three-quarters of a million tons annually.

The plant is expected to be in operation by Feb. 1. A shovel with a 12-yd. dip has been ordered, and modern preparation equipment, including picking tables, screens and loading booms, is being installed.

Houston Sells Properties

T. E. Houston, president, Houston Collieries Co., Cincinnati, Ohio, last of the pioneers in the Pocahontas coal field of West Virginia, has sold all his coal properties in that field to the Koppers Co., Pittsburgh, Pa. The properties include about 27,000 acres with estimated coal reserves of 300,000,000 tons.

While reports were that the deal involved between $15,000,000 and $20,000,000 Mr. Houston declined to divulge the figure. It is understood that the six operating plants that figured in the deal are the Maitland, Carswell, King, Tidewater, Keystone and Elkhorn properties.

Anthracite Engineers Discuss Safety

Mine safety was the keynote of the meeting of the Engineers' Society of Northeastern Pennsylvania held Dec. 14 at the Westmoreland Club, Wilkes-Barre, Pa. About 225 engineers from all parts of the hard-coal field attended. R. H. Buchanan, president of the South Penn Collieries Co. and president of the society, emphasized the influence of the organization in the anthracite field and urged a larger membership. The society now has 550 enrolled.

W. H. Glasgow, Secretary of the Pennsylvania Department of Mines, whose subject was "safety by Co-operation," assured the members of the hearty co-operation of his department, pointing out at the same time wherein the anthracite industry could draw upon the resources of the bureau to reduce accident hazards and property damage. Though admitting that fatal accidents were diminishing due to improved methods of mining he said that 50 per cent of such accidents might possibly be classed as preventable.

Mr. Glasgow advocated the use of the battery in blasts, which is the method exclusively followed in the bituminous fields and also is rapidly replacing the fuse or "squib" method in the anthracite region. He lauded the work of the state inspectors, but warned his hearers that not only should safety rules be made but rigidly enforced.

E. K. Spangler, safety engineer, Susquehanna Collieries Co. and Lytle Coal Co., described the measures and devices employed by his companies in safety work. He stated that in 1926 there were 484 fatal and 27,633 non-fatal accidents in the anthracite region.

The most prolific causes of accidents in coal mining, he said, are falls of rock or coal, gas explosions, haulage and premature shot explosions. Approximately 50 per cent of the fatal accidents are due to falls of rock or coal and 25 per cent of the non-fatal class are attributable to the same cause. Contrary to common belief, most accidents do not occur where second mining is being carried on. The reason for this, he said, undoubtedly is a consciousness of the fact that second mining is most hazardous and consequently is carried on with greater care.

Systematic methods of timbering, adequate supplies and prompt action before hazards arise, said Mr. Spangler, will contribute most to reduce accidents. Dangers of gas explosions can be guarded against best by thorough inspection and adequate ventilation. Blasting mishaps can be greatly reduced by educating the worker in the proper handling and use of explosives. Haulage accidents generally are due to workers being caught between cars and rib. This condition may easily be corrected by providing proper clearances and good trackage and by enforcing rules against riding cars or coupling them while they are in motion.

MARKET REVIEWS

Trends, Production and Prices in Principal Regions Of the Country

Coal Strike Dominates 1927 Bituminous Market

THE COAL STRIKE which wrecked the old Central Competitive Field as a wage-making unit dominated the bituminous market situation throughout the past year. That there would be a bitter and prolonged controversy in the union fields was early evident and coal consumers prepared themselves for the struggle by accumulating the largest reserve stocks in the history of the country. When the Jacksonville agreement expired on March 31 these consumers had approximately 75,000,000 tons in storage.

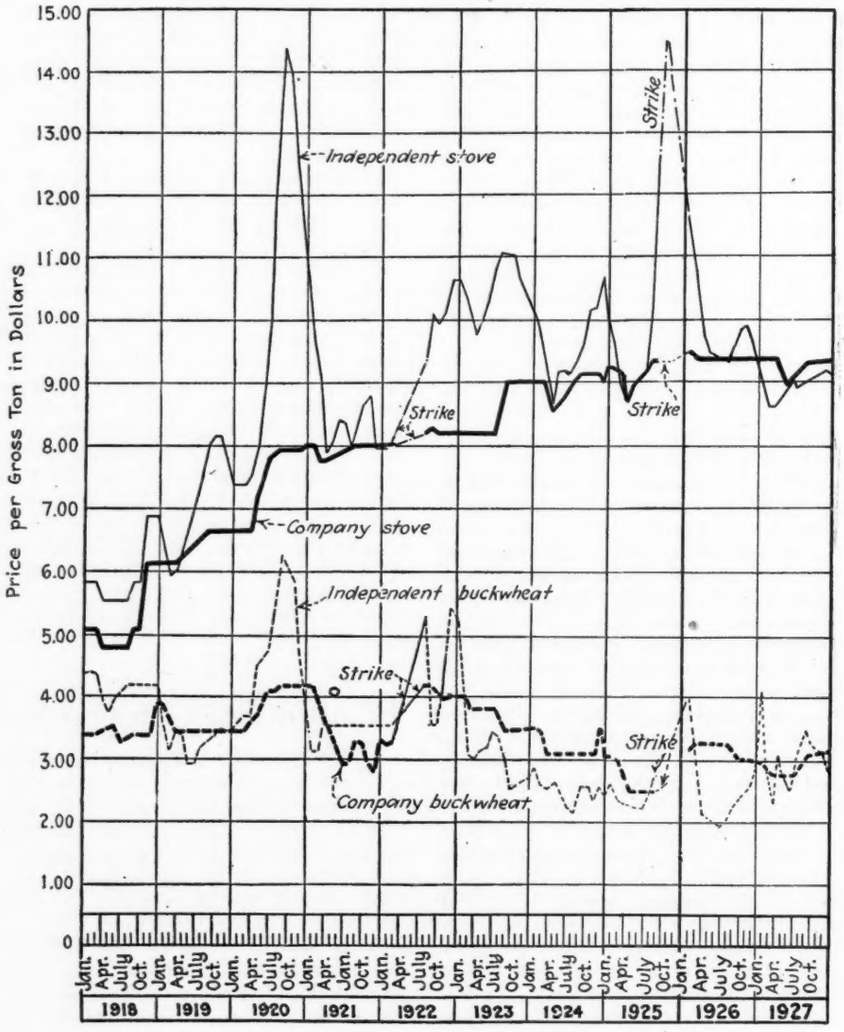
These stocks had been built up during the closing weeks of 1926 and the first quarter of 1927. Weekly production during the first quarter averaged 13,181,000 tons; consumption during the same period was estimated at 11,430,000 tons. During the next three months production dropped to a weekly average slightly over 8,000,000 tons and consumption fell to 8,920,000. Reserve stocks during that period diminished only 13,000,000 tons.

The nearest approach to a price flurry came in midsummer, when Western railroad buying in Eastern and Southern fields temporarily strengthend the general spot market basis. In the meantime, however, productive capacity in the strictly non-union fields was growing and defections from the ranks of the operators in Illinois and Indiana was increasing the output from those states. On top of this came open-shop developments in Ohio and Pennsylvania although the tonnage from those sections was not large.

Possibly the most significant indication of the absence of anything approaching a general buyers' panic was to be found in the situation in Illinois and Indiana. When the suspension started on April 1 mines in the former state had approximately 1,000,000 tons on cars as unbilled loads. The supply of free screenings was soon exhausted,

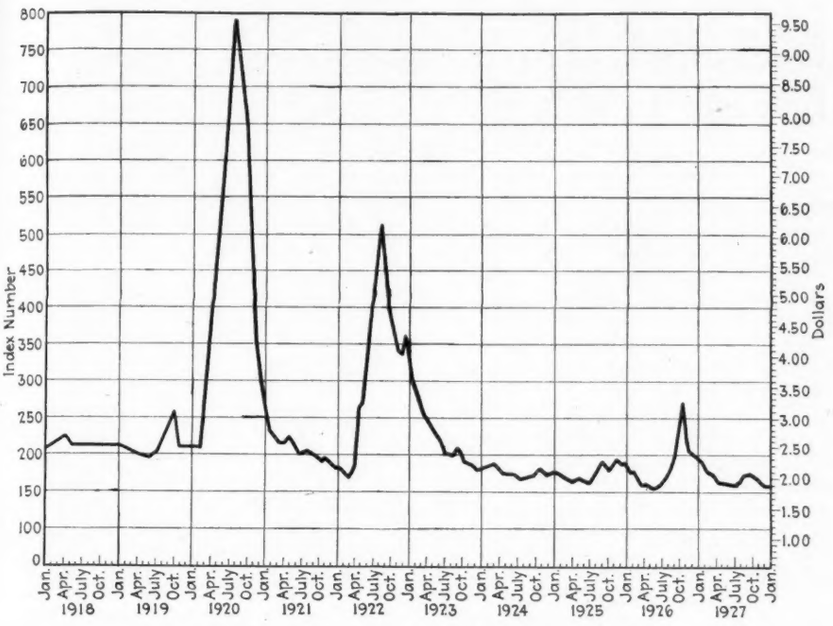
Bituminous Coal Production, Spot Prices and Index, by Weeks, 1927

Week Ended	Production (Net Tons)	Week Ended	Average Spot Price	Coal Age Index
Jan. 8	13,253,000	Jan. 3	$2.33	193
Jan. 15	13,571,000	Jan. 10	2.34	194
Jan. 22	13,474,000	Jan. 17	2.33	192
Jan. 29	13,536,000	Jan. 24	2.28	188
Feb. 5	13,583,000	Jan. 31	2.24	185
Feb. 12	13,487,000	Feb. 7	2.16	179
Feb. 19	13,193,000	Feb. 14	2.11	174
Feb. 26	12,763,000	Feb. 21	2.09	173
Mar. 5	13,262,000	Feb. 28	2.07	171
Mar. 12	13,778,000	Mar. 7	2.06	170
Mar. 19	13,020,000	Mar. 14	2.07	171
Mar. 26	13,373,000	Mar. 21	2.05	169
April 2	11,054,000	Mar. 28	2.07	171
April 9	8,255,000	April 4	2.09	172
April 16	8,001,000	April 11	1.87	155
April 23	7,937,000	April 18	1.87	155
April 30	8,424,000	April 25	1.90	157
May 7	8,185,000	May 2	1.91	158
May 14	8,402,000	May 9	1.90	157
May 21	8,27[illegible],000	May 16	1.88	155
May 28	8,476,000	May 23	1.86	154
June 4	7,379,000	May 30	1.86	154
June 11	8,524,000	June 6	1.85	153
June 18	8,284,000	June 13	1.86	154
June 25	8,479,000	June 20	1.85	153
July 2	7,981,000	June 27	1.83	151
July 9	6,577,000	July 5	1.84	152
July 16	8,245,000	July 13	1.82	150
July 23	8,259,000	July 20	1.82	150
July 30	8,594,000	July 27	1.88	155
Aug. 6	8,495,000	Aug. 3	1.98	164
Aug. 13	9,093,000	Aug. 10	1.99	164
Aug. 20	9,140,000	Aug. 17	2.04	169
Aug. 27	9,742,000	Aug. 24	2.11	174
Sept. 3	9,760,000	Aug. 31	2.11	174
Sept. 10	8,980,000	Sept. 7	2.09	173
Sept. 17	9,648,000	Sept. 14	2.05	169
Sept. 24	9,871,000	Sept. 21	2.07	171
Oct. 1	10,059,000	Sept. 28	2.07	171
Oct. 8	10,286,000	Oct. 5	2.02	167
Oct. 15	10,550,000	Oct. 12	1.98	164
Oct. 22	10,285,000	Oct. 19	1.96	162
Oct. 29	10,019,000	Oct. 26	1.94	160
Nov. 5	9,027,000	Nov. 2	1.92	159
Nov. 12	9,454,000	Nov. 9	1.90	157
Nov. 19	9,998,000	Nov. 16	1.91	158
Nov. 26	8,830,000	Nov. 23	1.90	157
Dec. 3	9,053,000	Nov. 30	1.90	157
Dec. 10	9,687,000	Dec. 7	1.94	160
Dec. 17	9,788,000	Dec. 14	1.90	157
Dec. 24	9,816,000	Dec. 21	1.89	156
Dec. 31	7,922,000	Dec. 28	1.89	156



Anthracite Prices for Ten Years

This diagram shows in dollars per gross ton the average company circular price and average spot quotations on "independent" stove and No. 1 buckwheat, f.o.b. mine basis, as quoted on the New York market.



Relative Spot Prices of Bituminous Coal

This diagram shows the relative and actual average prices. Prices for fourteen coals, representative of nearly 90 per cent of the total output of the United States, were weighted first, with respect to the proportions of slack, lump and run-of-mine normally shipped; and, second, with respect to the tonnage which each of the districts produced. The average for the twelve months ended June, 1914, is taken as 100, after the manner adopted in the Report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board. The index or relative numbers can be read on the left margin and the actual prices on the right.

but there were cars of "no-bill" prepared sizes carried on track at the mines for weeks after the suspension.

So well was industry supplied from other fields, however, that when large-scale operations were resumed in Illinois and Indiana early in October the disposition of the smaller sizes became a problem of immediate importance. At some mines these sizes began to pile up practically the first day hoisting was resumed and as the season progressed demand of the railroads that "no-bills" be counted against car allotments interfered with running time.

Spot prices for the country as a whole showed a progressive decline until August. The average for January was $2.34; for July it was only $1.87. August and September witnessed a moderate appreciation, but the decline again set in during the last quarter of the year and the weighted average for the month of December was only $1.90. The average for the year was the lowest reported since 1915.

From the standpoint of consistent movement the brightest feature of the bituminous trade the past year was the lake-cargo business. Shipments of cargo coal for the season to Dec. 25 were 32,830,312 net tons, as compared with 28,113,404 tons for the corresponding period in 1926 and 26,317,513 tons in 1925. The movement to the lakes last year established a new record. This was made possible by the close coordination of schedules at the mines and the lower lake ports and by steady movement from the docks over the Northwest although there were some periods during the season when dock operators wondered where they would find space for the cargoes en route.

The export trade was featureless. During the eleven months ended Nov. 30, 1927, the exports of bituminous coal were only 15,249,506 gross tons. For the corresponding period in 1926, when the British general strike threw an unusual demand upon American coal for foreign shipment, exports totaled 27,193,309 tons. Anthracite also suffered, but to a lesser extent. Hard-coal exports for the eleven months were 2,742,897 tons, as against 3,303,977 tons during the corresponding period in 1926.

Bituminous production as a whole last year is estimated at 519,000,000 to 520,000,000 net tons. In 1926 the total was 573,367,000 tons and in 1925 it was 520,053,000 tons. West Virginia, Pennsylvania and Kentucky lead in output, with the first two states fighting hard for leadership in tonnage. With the resumption of mining in Illinois, Kentucky output dropped sharply.

The volume of anthracite production last year was disappointing to those in the trade who had been bouyed up by the quick recovery made in sales at the end of the 1925-26 strike. Total commercial production for the year was estimated at 66,000,000 gross tons as compared with 69,648,000 tons in 1926. Shipments in 1927 approximated 63,500,000 gross tons; in 1926 the total was 67,248,946 tons.

Weather is charged with the major responsibility for this decline. The mild winter of 1926-27 cut into consumption and had an adverse effect upon early spring demand for fill-ups. This indifference also was reflected in buying of domestic sizes during the summer and fall months. On the other hand, growing demand for buckwheat for domestic heating and the recovery of some of the markets lost to steam sizes created a most unusual situation during part of the year when buckwheat was at a premium and some shippers demanded that buyers take some of the larger coal before assurance of prompt shipment of buckwheat would be given.

Average Spot Prices of Bituminous Coal, F.o.b. Mines

(Unit, net ton of 2,000 lb.)

Month	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927
January....	$1.21	$1.13	$1.53	$4.15	$2.48	$2.57	$2.57	$3.26	$2.25	$4.38	$2.21	$2.10	$2.18	$2.34
February...	1.16	1.12	1.40	4.18	2.53	2.49	2.58	2.77	2.20	3.59	2.25	2.04	2.09	2.11
March.....	1.17	1.09	1.27	3.89	2.58	2.47	2.58	2.63	2.12	3.20	2.15	1.99	2.01	2.06
April.....	1.16	1.08	1.24	3.21	2.64	2.43	3.85	2.62	2.24	2.84	2.07	1.95	1.92	1.93
May.....	1.16	1.07	1.21	4.14	2.67	2.38	4.59	2.68	3.11	2.68	2.04	1.97	1.93	1.87
June.....	1.12	1.07	1.26	4.00	2.57	2.40	7.18	2.52	3.32	2.56	2.03	1.95	1.90	1.85
July.....	1.12	1.05	1.22	3.17	2.58	2.47	8.24	2.40	4.67	2.40	1.98	1.93	1.91	1.87
August.....	1.13	1.07	1.30	3.24	2.58	2.76	9.51	2.42	6.13	2.39	1.99	2.04	2.00	2.06
September..	1.11	1.10	1.57	2.02	2.58	2.91	8.52	2.37	5.58	2.46	2.02	2.18	2.15	2.07
October....	1.13	1.12	2.26	2.02	2.58	3.09	7.78	2.33	4.48	2.28	2.10	2.13	2.70	1.96
November..	1.10	1.17	3.87	2.48	2.58	2.57	5.87	2.35	4.11	2.25	2.06	2.26	3.19	1.90
December..	1.11	1.33	4.01	2.48	2.58	2.58	4.38	2.26	4.05	2.18	2.06	2.19	2.53	1.90
1st Quarter.	$1.18	$1.11	$1.40	$4.07	$2.53	$2.51	$2.58	$2.89	$2.19	$3.72	$2.20	$2.04	$2.09	$2.17
2nd Quarter	1.15	1.07	1.24	3.78	2.63	2.40	5.20	2.61	2.64	2.69	2.04	1.96	1.92	1.88
3d Quarter.	1.12	1.07	1.36	2.81	2.58	2.71	8.76	2.40	5.46	2.42	2.00	2.05	2.02	2.00
4th Quarter..	1.11	1.21	3.38	2.33	2.58	2.74	6.01	2.31	4.21	2.23	2.07	2.19	2.81	1.92
Yearly aver.	$1.14	$1.12	$1.85	$3.25	$2.58	$2.59	$5.64	$2.55	$3.67	$2.77	$2.08	$2.06	$2.21	$1.99

Relative Prices of Bituminous Coal

(Spot prices July, 1913–June, 1914, as base)

Month	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927
January....	100	93	126	343	205	213	212	270	186	362	183	173	180	190
February...	96	92	116	346	209	206	213	229	182	297	186	168	172	174
March.....	96	90	105	321	214	204	213	217	175	264	178	165	166	170
April.....	96	89	103	265	218	200	318	217	185	235	171	161	159	159
May.....	96	89	100	342	221	197	379	222	257	221	169	162	159	155
June.....	93	88	104	331	212	198	593	208	274	212	167	161	157	153
July.....	93	87	101	262	213	204	681	198	386	198	163	160	158	154
August.....	93	88	107	268	213	228	786	200	507	198	164	166	165	170
September..	92	91	130	167	213	241	704	196	461	203	167	179	178	171
October....	93	93	187	167	213	256	643	193	370	188	174	176	223	162
November..	91	97	320	205	213	212	485	194	340	186	170	187	264	157
December..	92	110	332	205	213	213	362	187	335	180	170	181	209	157
1st Quarter.	97	92	116	337	209	208	213	239	181	307	182	169	173	178
2nd Quarter	95	89	102	313	217	198	430	216	218	222	169	162	158	156
3d Quarter.	93	89	113	232	213	224	723	198	451	200	165	168	167	165
4th Quarter	92	97	280	192	213	227	497	191	438	184	171	181	232	159
Yearly aver.	94	91	152	269	213	214	466	211	303	226	172	170	182	164

Wage Problem and Oversupply Prove Too Much for Midwest Trade

By H. A. Requa

COAL operators of the Middle West have been pretty thoroughly hardened to adversity, so they were not greatly surprised when 1927 proved to be another disappointment.

The coal fields of Illinois and Indiana for some years have been under tremendous handicaps which have made it practically impossible for any Middle Western mine to operate at a profit. The chief obstacle is the Jacksonville wage scale, and secondly, in common with most all coal-producing districts in these United States, there is a vast overproduction. Illinois and Indiana mines have not worked to capacity for some years, yet there is scarcely any time of the year that the Chicago market and other local distributing centers are not glutted with coal, and most of it produced from nearby mines. At the first suspicion of a better market, tonnage figures jump so quickly that there is an immediate relapse, even before a good start has been made.

The Jacksonville scale has hindered the operator to the point where he has had to stand by and see his logical and rightful market taken away from under his nose by non-union invaders. How long the Middle Western producer is going to stand for this is a matter of some speculation, but it can't last much longer, for if present conditions continue, the majority of Illinois and Indiana operators will soon be stone broke, and it will be increasingly difficult to interest capital in an industry and state where opportunities for a legitimate profit are so small.

Business was fairly good from Jan. 1 until March 31, when the Jacksonville agreement expired. The public knew a great many of the coal-producing companies were against continuing on the Jacksonville scale and as a result many consumers bought freely to tide themselves over the period they expected the mines would be down. Purchasing agents figured the shutdown would last from 60 to 120 days, and each bought according to his individual opinion. The result, of course, was that in three months the mines had given to them business that normally should have come to them over a six months period. Capacity of the mines was such, however, that this crowding of the market was taken care of without the slightest difficulty or any remarkable advances in price, an indication which pretty conclusively shows how thoroughly overmanned and overequipped the industry is in the Middle West.

On April 1 all mines—with a few unimportant exceptions—closed down and awaited developments; the operators, taking stock of their own situation, with special emphasis on the effect of the shutdown in connection with their bank loans, and the miners, on their side, either went to farming, road building or sitting home and hoping for something to happen.

The summer dragged on, and Illinois and Indiana saw their coal market invaded again by non-union coal. In spite of the stoppage of local production plenty of coal was available on all sides and at low prices compared even to ordinary years. Western Kentucky coal, which in the past had always profited by a strike in Illinois and Indiana, had only a fair market, with prices only average. Thus the summer continued to drag on, with the public completely indifferent to coal and refusing to become interested. A few strip mines in Indiana thought they saw a change for a little profit, and signed up with the union on the Jacksonville scale. The same thing happened in a smaller way in Illinois.

Fall came, and with it no great demand although prices on non-union coal did go up to some slight degree. In September there were rumors that the operators and miners were going to get together and settle their differences. Nothing happened from the early conferences, however, except that they had the effect of keeping the market down, as peace was generally anticipated.

Several more conferences took place, offers were made and refused, and rumors filled the air. In coal circles the story went that the big, strongly financed corporations were willing to sign up on the basis of the old Jacksonville scale, for the big fellows believed that through the use of mechanical loaders and other labor-saving devices which they could afford to buy they would be able to produce coal cheaply enough to hold their market and make

Spot Prices, F.o.b. Mines, Southern Illinois (Franklin County) Coal, 1927

CHICAGO MARKET

Month	Lump	Run of Mine	Screenings	Weighted Av. All Sizes
January	$4.00	$2.63	$1.88	$3.16
February	3.15	2.63	2.07	2.78
March	3.15	2.63	2.44	2.85
April	3.15	2.63	2.45	2.85
May	3.15	*	*	3.15
June	3.15	*	*	3.15
July	3.15	*	*	3.15
August	3.15	*	*	3.15
September	*	*	*	*
October	3.50	2.43	1.67	2.81
November	3.41	2.38	1.55	2.71
December	3.38	2.38	1.60	2.72
Yearly average	$3.30	$2.53	$1.95	$2.95

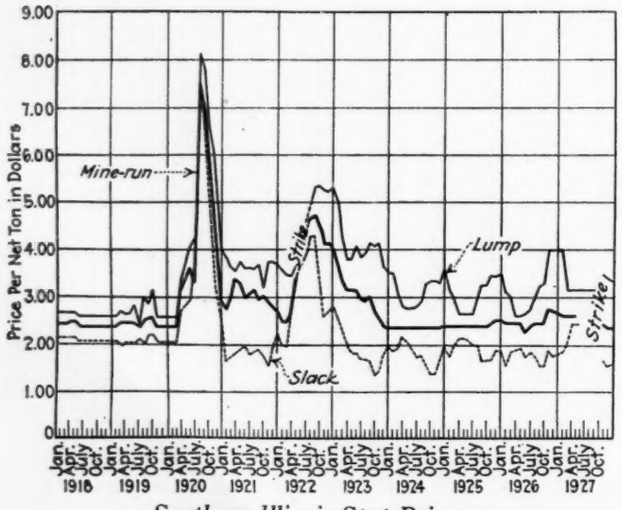
* Quotations withdrawn because of strike.

Spot Prices, F.o.b. Mines, of Central Illinois Coal, 1927

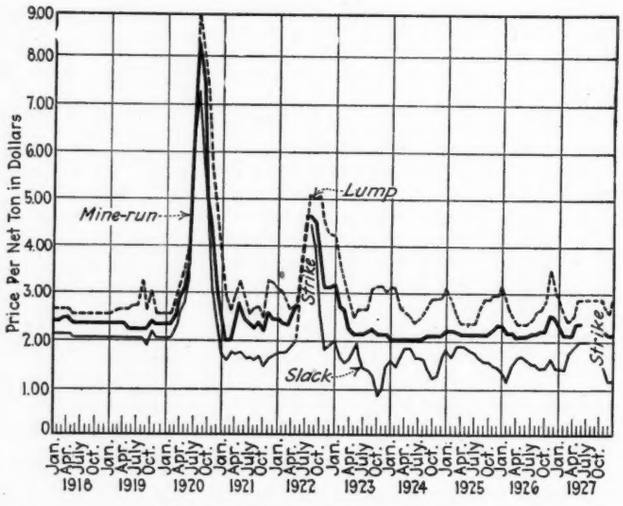
CHICAGO MARKET

Month	Lump	Run of Mine	Screenings	Weighted Av. All Sizes
January	$2.60	$2.13	$1.43	$2.23
February	2.42	2.13	1.77	2.23
March	2.55	2.13	1.88	2.38
April	2.88	2.38	2.00	2.55
May	2.88	2.38	2.00	2.55
June	*	*	*	*
July	2.88	*	*	2.88
August	2.88	*	*	2.88
September	*	*	*	*
October	2.78	2.18	1.45	2.33
November	2.63	2.13	1.18	2.19
December	2.88	2.13	1.20	2.32
Yearly average	$2.74	$2.20	$1.61	$2.45

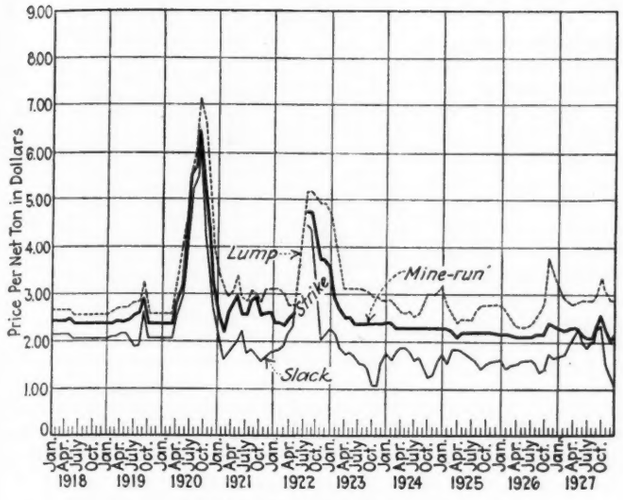
* Quotations withdrawn because of strike.



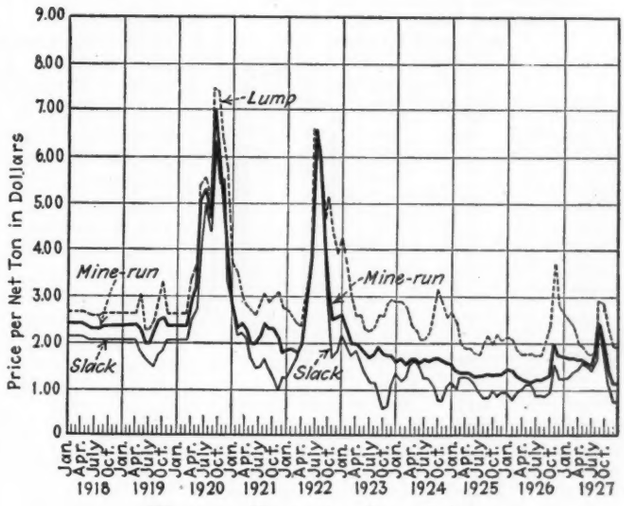
Southern Illinois Spot Prices



Central Illinois Spot Prices



Fourth and Fifth Vein, Indiana, Spot Prices



Western Kentucky Spot Prices

a little profit besides. The smaller companies did not like this, because they thought that they would soon be driven out of business unless they had relief through a much lower wage scale.

Fairly unexpectedly the strike was settled early in October, with the understanding that the men were to go back to work at once on the Jacksonville scale, but that a committee was to be appointed, consisting of both operators and miners, whose duty it would be to draw up a new wage scale to become effective April 1, 1928. Why this was done and what progress has been made to date by this committee is not generally known, but it certainly looks as if they would have plenty of time to adjust their differences between the date of their appointment last fall and the expiration of their "interim" agreement next April.

After the settlement of the strike in October, business was exceedingly quiet, which was all the more remarkable when one realizes that the fall months usually are the best of all from a coal standpoint and, further, that two important coal-producing states had been closed down all summer. The story from the settlement of the shutdown to the end of the year is soon told, as it is a story of one to three days per week running time for the mines, glutted markets and low prices, with nothing in the future to indicate any great relief.

Spot Prices, F.o.b. Mines of Indiana 4th and 5th Vein Coals, 1927

CHICAGO MARKET

Month	Lump	Run of Mine	Screenings	Weighted Av. All Sizes
January	$2.96	$2.25	$1.75	$2.43
February	2.84	2.29	1.93	2.44
March	2.80	2.32	2.09	2.47
April	2.85	2.32	2.26	2.52
May	2.88	2.16	1.99	2.42
June	2.88	2.13	1.90	2.38
July	2.88	2.13	2.02	2.41
August	2.99	2.34	2.25	2.58
September	3.34	2.55	2.35	2.82
October	3.13	2.26	1.51	2.49
November	2.88	2.02	1.28	2.22
December	2.88	2.15	1.13	2.22
Yearly average	$2.94	$2.24	$1.87	$2.45

Kentucky Coal Fields Make Progress In Year of Moderate Profit

BY A. W. WILLIAMS

LAST YEAR in Kentucky's coal fields proved a fairly good one from the standpoint of total production, as final figures for the year are expected to show an increase of about 7,000,000 tons. Over a considerable portion of the year sales too were at levels which enabled the operators to make a little money. The strike in the union fields north of the Ohio River resulted in a good demand for Kentucky coal and during the spring and summer general movement was better than for some years past in the warm season.

Though prices were somewhat better than normal, still there was no runaway market. Whereas in past strikes production was largely controlled by union, the reverse was true last year. The top price reached for Kentucky coal over the year was about $3.75 for fine grades of gas or byproduct lump coal, principally advertised brands and those with good sales connections established. At no time were levels reached as high as those brought about the previous year by export demand during the British strike.

Few failures were reported in Kentucky last year and fewer mines were offered under the hammer than at any time in several years. Labor conditions were rather favorable. In late summer western Kentucky voluntarily increased wages by about 20 per cent over the 1917 level in effect. When the strike was settled and competitive conditions became harder, the increase was removed, and without much trouble—only a few men out for less than a week.

Eastern Kentucky reported virtually no labor troubles. Mines in both fields were able to make good running time, and while wages were lower than in the union fields, the workers were much better off in the Kentucky fields.

Everything has not been rosy for the Kentucky coal industry, however. Interstate Commerce Commission decisions hurt prospects for both eastern and western Kentucky. In the Illinois rate case the increased differential placed Kentucky mines in the western part of the state at a further disadvantage, the differential to some sections now being 35c. instead of 25c. a ton.

Eastern Kentucky suffered in the lake cargo rate case when the differential in favor of Ohio and Pennsylvania mines was increased 20c. a ton through reduction of rates from those sections on cargo coal while Kentucky rates were unchanged.

Very few new operations were started in the state, general overproduction of coal for the country having resulted in its being cheaper to buy an established operation than to go to the expense of developing new ones. The development of strip mining in western Kentucky slumped off considerably. One of the larger stripping organizations, while continuing such operations, developed its underground facilities until its deep-mine output is twice its strip production. There are fewer strip mines in the state today than there were two or even

Spot Prices, F.o.b. Mines, Western Kentucky Coal, 1927

AVERAGE OF QUOTATIONS ON CHICAGO AND LOUISVILLE MARKETS

Month	Lump	Run of Mine	Screenings	Weighted Av. All Sizes
January	$2.49	$1.67	$1.29	$1.90
February	2.36	1.68	1.39	1.87
March	2.00	1.63	1.45	1.73
April	1.95	1.64	1.61	1.75
May	1.79	1.49	1.56	1.61
June	1.76	1.44	1.51	1.55
July	1.85	1.65	1.74	1.73
August	2.93	2.43	2.38	2.58
September	2.87	1.90	1.97	2.29
October	2.41	1.42	1.10	1.72
November	1.97	1.15	.74	1.36
December	1.96	1.16	.75	1.37
Yearly average	$2.19	$1.61	$1.46	$1.79

Spot Prices, F.o.b. Mines, Coals of Standard District (Ill.), 1927

ST. LOUIS MARKET

Month	Lump	Run of Mine	Screenings	Weighted Av. All Sizes
January	$2.39	$1.83	$1.17	$1.98
February	2.45	1.83	1.24	2.03
March	2.45	1.83	1.38	2.05
April	2.75	2.00	1.75	2.32
May	2.75	2.00	1.75	2.32
June	2.75	2.00	1.75	2.32
July	2.63	2.00	1.88	2.28
August	2.80	2.38	2.33	2.56
September	3.07	2.24	2.27	2.64
October	2.61	2.06	.91	2.10
November	2.63	1.86	.78	2.04
December	2.55	1.95	1.10	2.04
Yearly average	$2.65	$2.00	$1.53	$2.22

three years ago. Unfavorable weather conditions, undetermined amounts of overburden to remove, lack of proper core drilling and testing of coal, resulting in running into strata of poor coal, have caused a slump in strip production.

A severe blow to the Hazard field late in May was the cloudburst which caused many deaths, put railroads, power lines, roads and wires out of commission and closed down many mines. Within 20 days most of the mines in the Hazard and Elkhorn fields were back in operation. Mines in this section lost a considerable tonnage moving to the lakes during the period of inactivity, however.

In western Kentucky all previous records for production were cracked in the summer months, when weekly loadings exceeded 10,000 cars. Much of this coal moved into the Illinois and Michigan industrial centers. Eastern Kentucky moved a considerable tonnage into the lake states and toward the Northeast during the strike period, but was at a rate disadvantage in moving steam coal to Chicago and the Northwest.

River transportation on the Ohio made some progress during the year, and a 9-ft. year-round boating stage is promised by the close of 1929. Two of the larger river transportation companies recently merged, and indications are that the day is not far distant when coal movement on the Ohio River will again become a large factor in total tonnage moved.

While there was much discussion of large mergers in both eastern and western Kentucky fields during the year, nothing of real importance developed along this line. There also was much discussion of co-operative marketing and other ideas, which came to naught on account of the danger of running counter to the anti-trust laws.

Unusually fine service was provided by the railroads in the Kentucky fields throughout the year. There was so little car shortage anywhere that it was hardly noticeable. The carriers have developed their facilities for coal-handling in both cars and motive power. The Louisville & Nashville R.R. has just arranged to spend $10,000,000 in further improvement, much of which will be used in providing connections out of southeastern Kentucky to the South Atlantic ports.

The outlook for 1928 isn't considered especially bright by the Kentucky coal trade. Much depends on the final outcome of the lake cargo rate case. Should the Interstate Commerce Commission rule against the Southern roads and permit the increased differential to stand, the only possible way in which eastern Kentucky could continue to meet competition of the Northern fields in placing coal at lower lake ports would be through further reduction of mine wages, and that isn't desired.

Western Kentucky is in much the same shape, in meeting competition to Northern markets with a 35c. differential. With the present rate situation Kentucky fields probably will be rather bottled up next season, unless the unsettled wage conditions in the union fields result in another strike, and enable the Kentucky fields to market coal at better than anticipated prices.

Spot Prices, F.o.b. Mines, Coals of Mt. Olive District (Ill.), 1927

ST. LOUIS MARKET

Month	Lump	Run of Mine	Screenings	Weighted Av. All Sizes
January	$2.88	$2.50	$1.50	$2.50
February	2.78	2.50	1.68	2.48
March	2.88	2.50	1.68	2.53
April	2.98	2.90	1.94	2.76
May	3.00	3.00	2.00	2.82
June	3.00	3.00	2.00	2.82
July	3.00	3.00	2.00	2.82
August	*	*	*	*
September	*	*	*	*
October	3.00	2.13	1.38	2.41
November	2.88	2.21	1.45	2.40
December	2.75	2.21	1.17	2.32
Yearly average	$2.91	$2.60	$1.68	$2.59

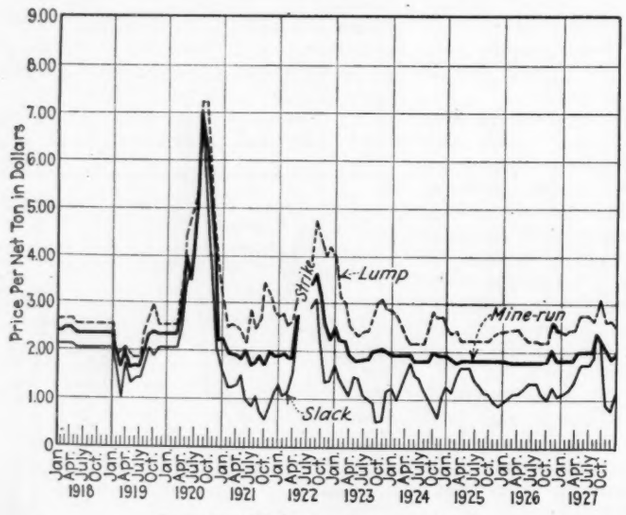
* Quotations withdrawn because of strike.

Northwest Docks Make Record Shipments In Year of Active Trade

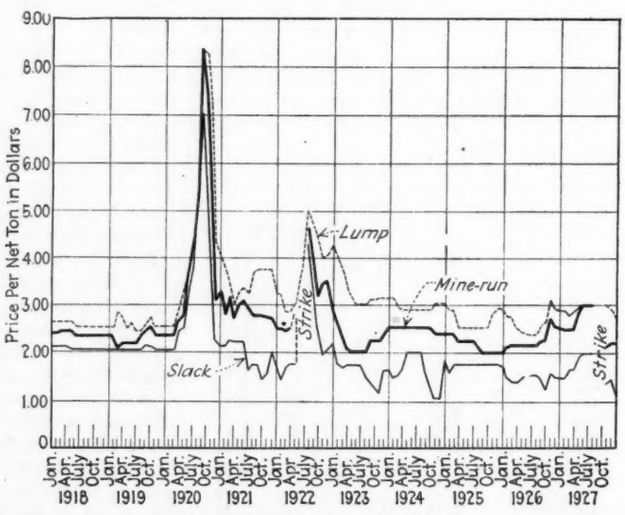
BY S. J. SCHULTE

COAL DOCK operators at Duluth and Superior had one of the most satisfactory periods in their business history during the last year. Despite the virtual elimination of shipments from union districts in Ohio and Pennsylvania because of the strike in the Central Competitive Field coal moved in uniform volume to the Head of the Lakes throughout the navigation season. Increased shipments from the non-union mines of West Virginia and Kentucky stilled any fears of a shortage. Coal stocks on the docks now comprise approximately 7,000,000 tons, or 2,000,000 tons more than a year ago.

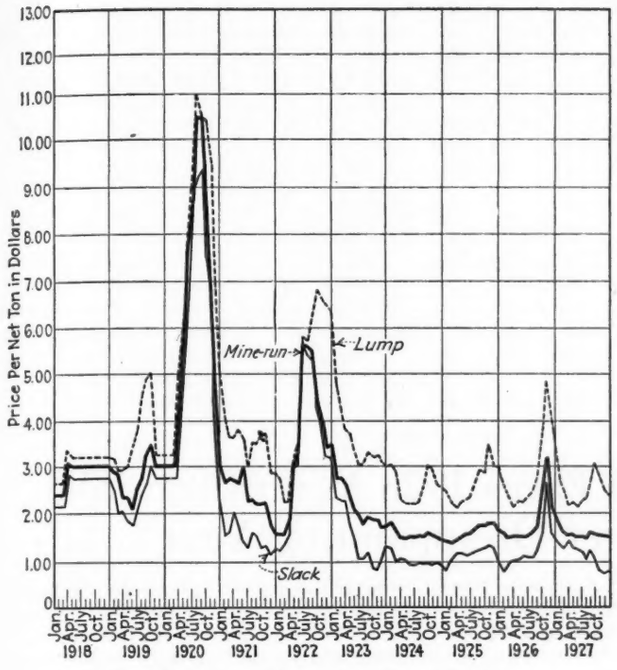
Shipments from the docks during 1927 broke all records, aggregating 261,165 carloads, as against 255,697 cars in the preceding year and 239,548 cars in 1925. Movement from the docks was light during the spring and summer, but thereafter close to capacity operation was the rule. Prices were well maintained throughout the season, identical figures having been submitted on contracts for municipalities, utilities and other large consumers. As a



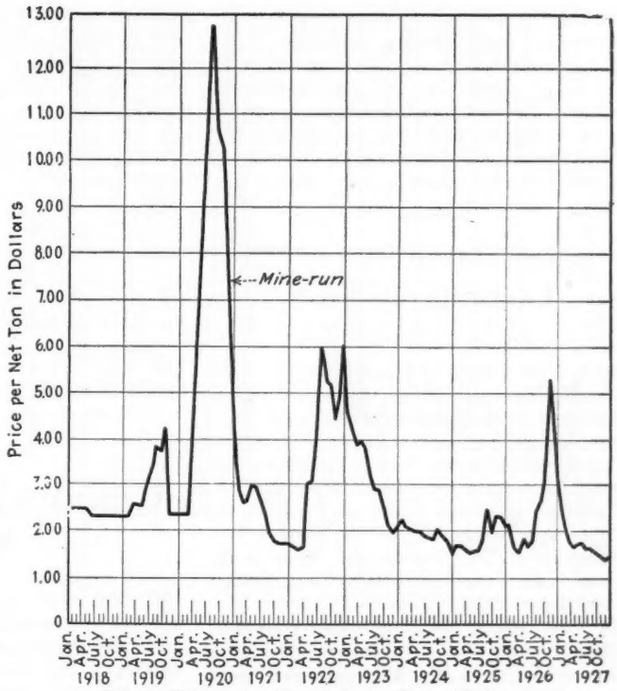
Standard District Spot Prices



Mount Olive Spot Prices



Southeastern Kentucky Spot Prices



West Virginia Smokeless Spot Prices

result there was a disposition to place contracts earlier than has normally been the custom in recent years.

There was a further falling off in the consumption of anthracite in the Northwest and a corresponding increase in the use of smokeless coal, domestic coke and briquets as substitutes. With anthracite egg, stove and nut quoted at $13.20@$13.60, prepared sizes of West Virginia smokeless sold at $7@$8; domestic coke $9; briquets, $9.

Receipts by lake were the second largest on record, totalling 12,433,638 net tons, which was exceeded only in 1923, when 12,638,321 tons came in. Bituminous receipts were 11,452,444 tons, an increase of 1,992,009 tons over the preceding year. Anthracite cargoes —981,194 tons—on the other hand, showed a decline of 291,779 tons. Monthly receipts at Duluth and Superior docks during the 1927 season of navigation are shown in the following table, in net tons:

	Hard	Soft	Total
April	44,900	1,038,302	1,083,202
May	174,596	2,267,056	2,441,652
June	127,702	1,942,004	2,069,706
July	86,371	1,713,646	1,800,017
August	112,737	1,383,846	1,496,583
September	168,137	1,210,364	1,378,501
October	178,217	1,015,459	1,193,676
November	78,488	796,835	875,323
December	10,046	84,932	94,978
Total for season	981,194	11,452,444	12,433,638

The comparative statement of shipments for the last eight years follows:

	Hard	Soft	Total
1920	1,637,477	7,393,219	9,030,696
1921	1,844,642	8,320,207	10,164,849
1922	566,362	5,138,934	5,705,296
1923	1,419,984	11,268,337	12,688,321
1924	1,289,994	7,730,878	9,020,872
1925	790,132	8,882,569	9,672,701
1926	1,272,973	9,168,656	10,441,629
1927	981,194	11,452,444	12,433,638
Av. total received during last eight years			9,894,750

Comparative shipments on cars from Duluth and Superior docks during the calendar years 1927, 1926 and 1925, as compiled by the Western Weighing and Inspection Bureau, were as follows:

	1927 Cars	1926 Cars	1925 Cars
January	27,547	23,990	27,693
February	21,091	19,219	17,666
March	14,646	14,836	16,388
April	13,218	11,855	9,210
May	15,117	11,808	12,302
June	14,495	12,659	11,955
July	13,267	16,223	14,693
August	23,703	18,306	20,778
September	25,794	27,590	24,032
October	32,178	30,993	31,685
November	30,109	35,531	27,411
December	*30,000	32,687	25,735
Totals	261,165	255,697	239,548

* Estimated.

Utah Trade Experiences Unsteady Year

A RATHER colorless year in the Salt Lake City trade, with slack showing a soft tendency in the latter half, was materially relieved by the Colorado strike and emergency coal rates from Utah. Domestic demand was unsteady due to mild temperature, though the weather was severe during most of December and all mines were working close to full time as the year neared its close. The labor and car situations were good throughout the year and there was no mine disability of any consequence.

Output by Utah mines during the first eleven months of 1927 was 4,173,871 tons, compared with 3,868,549 tons in the corresponding period of the preceding year and 4,373,793 tons for the whole of 1926.

Among the important developments of the last year was the formation of the Utah Coal Producers' Association, with all but two or three companies enrolled. A statewide retail association also was organized. Both bodies elected permanent officers.

Agitation from time to time for a smokeless coal resulted late in the year in the appointment by the Salt Lake City Chamber of Commerce of a committee to study the problem with a view to the Chamber getting behind a plant if smokeless fuel on a commercial scale is considered feasible. An announcement of much interest in this connection was that natural gas would be brought from

Spot Prices, F.o.b. Mines, Southeastern Kentucky Coal, 1927

AVERAGE OF QUOTATIONS ON CINCINNATI, CHICAGO AND LOUISVILLE MARKETS

Month	Lump	Run of Mine	Screenings	Weighted Av. All Sizes
January	$2.72	$1.79	$1.39	$2.28
February	2.47	1.65	1.29	2.09
March	2.18	1.59	1.45	1.92
April	2.23	1.62	1.31	1.91
May	2.15	1.57	1.26	1.87
June	2.27	1.57	1.19	1.94
July	2.35	1.51	1.05	1.94
August	2.76	1.62	1.25	2.25
September	3.07	1.59	1.12	2.40
October	2.79	1.58	.85	2.21
November	2.52	1.54	.77	2.01
December	2.38	1.53	.82	1.93
Yearly average	$2.49	$1.60	$1.15	$2.06

Spot Prices, F.o.b. Mines, Southern West Virginia Smokeless Run-of-Mine Coal, 1927

VARIOUS MARKETS

Month	Columbus	Chicago	Cincinnati	Boston	Average All Markets
January	$2.43	$2.65	$2.58	$2.41	$2.54
February	2.38	2.53	2.47	1.99	2.34
March	2.13	1.93	2.06	1.76	1.97
April	2.14	2.07	2.20	1.67	2.02
May	2.20	1.94	2.25	1.71	2.03
June	2.17	1.88	2.19	1.75	2.00
July	2.13	1.88	2.13	1.62	1.94
August	2.21	2.02	2.20	1.63	2.02
September	2.13	1.92	2.07	1.55	1.95
October	1.89	1.85	2.13	1.46	1.84
November	1.85	1.83	1.97	1.39	1.76
December	1.85	1.88	2.13	1.47	1.83
Yearly av.	$2.13	$2.03	$2.21	$1.70	$2.02

Wyoming to Utah to take care of both industrial and domestic fuel needs.

The outlook for the coal industry in Utah is favorable for the immediate future, but the activities of the natural-gas interests and the movement for smokeless fuel tend to put a damper on predictions for many months ahead.

Labor Troubles Disturb Colorado Industry

By F. O. Sandstrom

OUTPUT in Colorado in 1927—approximately 8,600,000 tons—shows a decrease of nearly 2,000,000 tons from the preceding year, which is entirely attributable to the strike called by the I.W.W. on Oct. 18. The average number of men employed was 9,200 compared with 11,414 in 1926. The number of days worked per mine in the last year averaged 147.4 as against 162.6 for 1926.

The ruling price on lump coal was $4.75; nut, $4.25; steam sizes ranging from 75c. to $1.50. The minimum price on Rock Springs-Kemmerer domestic lump was $3.75 and domestic nut $3.50, while the maximum prices were $4.50 and $4.

While the strike threat of the I.W.W. hung in the air the operators granted a voluntary increase in wages of 75c., bringing the scale to $6.25. The I.W.W. leaders, insistent on the Jacksonville scale, however, called a strike. The struggle had been marked by picketing and riots, which reached a climax in the killing of six miners in a gun fight in the northern field. Many mines are still affected.

In addition to the labor situation the coal industry is faced with competition from natural gas, which is to be brought in by pipe line from the Amarillo field next summer. With the possibility of serious inroads on production the future for coal is uncertain and operators in general are hesitant about planning extensive improvements. Routt County producers, however, will profit from a transportation standpoint through the completion of the Moffat Tunnel.

Southwest Output Heavy Despite Strike

By Sam Webb

THE feature of the coal trade in the Southwest in 1927 was the surprising manner in which production held up in the face of the longest strike on record. Output in Arkansas, Kansas, Missouri and Oklahoma for the year is estimated at about 10,000,000 tons, compared with 11,287,000 tons in 1926. This was due largely to nearly continuous capacity production in Oklahoma, where operators reaped the benefit of a successful fight on the union in 1926. Oklahoma operated all year on practically a 100 per cent non-union basis.

In other fields more labor difficulties were encountered, especially in the Paris field in Arkansas and the Cherokee district in Kansas. Steam shovels operated co-operatively, however, finally boosted Kansas production to nearly 60 per cent of normal, and non-union mines in Arkansas in other than the Paris field turned out 40 per cent of normal tonnage.

Heavy buying of coal prior to the strike April 1 resulted in the largest coal stocks on record, and storage piles are still above normal for the season. Retailers were slow to fill their yards, but sparingly as they bought, they found that they were overstocked when the first cold weather arrived.

The price situation has been unsettled. Kansas coal sold on the widest range in years, shovel lump showing a spread from $3 to $4 a ton. Some operators held their Kansas deep-shaft lump at $5 a ton, or 25c. higher than a year ago. Prices of other classes ranged from steady to $1.25 a ton lower than a year ago. Kansas City domestic consumers used about 500,000 tons of prepared sizes in 1927, a decrease of 10 per cent compared with 1926.

The outlook for 1928 is uncertain. Another strike is imminent April 1, when the present temporary agreement expires, but if it does not interfere with production any more than the recent strike, supplies will again be in excess of demand and prices unsatisfactory.

Cincinnati Faces 1928 With Clean Slate After Disappointing Year

ASIDE from record shipments of coal to the lakes the past year was one of keen disappointment in the Cincinnati market. The low-volatile trade, it is true, held to a relatively even keel during the year, but on the high-volatile side it was a different story—and a gloomy one. This was especially marked during the last three and a half months of the year, with high-volatile nut and slack quoted as low as 40c. and sales made at even a dime less in mid-November.

Demand and prices for high-volatile coals were fairly good at the dawn of the old year and held their own in good style until April 1. Then when the suspension in the union fields set in there was a steady improvement, reaching its height during the lake shipping season until the strike settlement in Illinois and Indiana on Oct. 1.

Because of the strike and the heavy movement to the lakes the midsummer season usually the dullest of the year, was markedly active. In mid-September the movement of tonnage was unabated and there was talk of price advances for October. When the operators in Illinois and Indiana signed a truce with the union on Oct. 1 the bottom dropped out and business grew steadily worse.

Producers began to curtail output, but not enough to prevent the accumulation of distress coal which the lake trade was unable to absorb. Industrial purchases were confined to current requirements, the larger consumers in most instances depending on healthy stockpiles. Domestic demand also was disappointing due to the prevalence of unusually mild weather almost to the end of the year.

Around the middle of November producers in West Virginia and Kentucky made arrangements to reduce working time and during December the mines were averaging about two days a week, some shutting down entirely around the holidays. This served to ease the situation, so that distress tonnage was cleared up, prices steadied and output was more in line with the absorbtive ability of the market. Business in both the steam and domestic lines at the close of the year fell short of what the trade would term satisfactory, but marked improvement during the last six weeks of the year has brightened the outlook.

In the low-volatile trade, on the other hand, business was much steadier, with domestic smokeless continuing to make headway in anthracite-consuming territory. Prepared sizes maintained prices in good shape practically throughout the year, reaching the high spot during the strike. Screenings, however, weakened with the lull in the steel industry. Low-volatile producers were able to maintain good working time until close to Dec. 1, when a number of mines curtailed, some shutting down.

Several recent mergers of large companies and reports of other contemplated amalgamations of high-volatile operations in both West Virginia and eastern Kentucky have elicited more than ordinary interest in Cincinnati as they are seen as the forerunner of reduced operating expenses with a resultant opportunity of doing business at a profit.

Big Stocks, Low Prices Hurt Cleveland

By Dale Cox

LARGE surplus stocks of bituminous coal that increased rather than declined as the strike in the Midwestern fields wore on made the Cleveland coal market during 1927 strictly a buyers' market, with prices lower than at any time since the Jacksonville wage agreement was adopted except for a short time during September and October.

Lake shipments of coal from Cleveland during 1927 surpassed any previous year. October, for example, set an all-time record for the amount of coal cleared. Most of it was consigned to the Northwest and by far the greater part of it was coal from the West Virginia and Kentucky field.

The year began with a large surplus

of coal in storage, which increased steadily, despite the strike, until about Nov. 1. Local dealers and brokers believe the amount in storage has decreased somewhat in the last sixty days.

Weather conditions, a decline in industrial activity in Cleveland and the cities to which it formerly has shipped coal and the large production in the West Virginia and Kentucky fields are blamed by dealers for the condition of the local market during the past year.

Cleveland dealers were distinctly surprised that the strike in the western bituminous field did not result in better prices here. They expected a shortage to develop after the strike had worn on and the surplus piled up in anticipation of the strike had been depleted. Instead of their expectations being borne out, the surplus that already existed before the strike began was increased by large shipments from the West Virginia and Kentucky fields.

No immediate remedy is seen for the surplus stocks now existing. A number of Ohio mines are operating again with non-union labor, and others are scheduled to open soon, and this increase in production is expected to add to the already extensive stores of coal on hand here. Every indication, Cleveland brokers say, points to 1928 being a buyers' market. They do not believe the upward turn is likely to set in as early as 1928.

Columbus Has Worst Year in Decade; Price Trend Steadily Downward

By J. W. Lehman

THE coal trade in Columbus during 1927 was at the lowest point of any year in the last decade. While conditions at the opening of the year were bad, there was a steady decline to lower prices, with reduced demand and the prolonged strike bringing about an unusual situation. Past performances proved useless in formulating a policy for future action.

The domestic trade was handicapped by unusually warm weather in February, March, October and November. In addition to this disadvantage, dealers had to contend with 48c. natural gas, a rate fixed by the federal court, the installation of many oil-burning units in buildings and residences and the installation of automatic stokers in large heating plants. "Snowbirds" also appeared in larger numbers than ever before.

The steam-coal business suffered because of the large tonnage produced and the industrial depression which reduced fuel requisitions. The fact that railroads generally gave 100 per cent service in transporting coal had the effect of putting out of business a number of wholesalers who usually depended on better service as their stock in trade. With operators selling to consumers at the same price given jobbers, many of the latter have been gradually forced out of the market.

During former strikes there has been a gradually increasing demand attended by price advances. But the latest flare-up had the opposite tendency. With the large production in the non-union fields and the fact that later on several states came in under union arrangements, there was no fuel shortage at any time.

Price tendencies were downward from the first of the year until the last day. The boom in prices of October and early November, 1926, having given way, the opening price of splints was about $3.50; smokeless, $4.50@$4.75, and Ohio grades at $3. At the close of the year, West Virginia low-volatile grades were selling at $3.75; splints and West Virginia high-volatiles at $2.50@$2.75, and Ohio grades at $2@$2.25.

Another unusual development was the weakness of screenings, which in former strike years have generally remained strong. Screenings reached the abnormally low point of 35c.@65c. during the latter part of the year, but some recovery was reported at the close.

Prospects for 1928 are far from bright. With an oversupply of coal and high potential production little hope is held out for any marked recovery. Reduced industrial activity is expected to continue and it appears to be the fight of the survival of the fittest in the coal industry. In this fight Ohio operators are at a big disadvantage and there seems to be only a slim chance for an improvement in the situation in the Buckeye State. Low prices, oversupply and continued wrangling between operators and union officials are the most probable developments for the first half of the new year.

Spot Prices, F.o.b. Mines, Southern West Virginia High-Volatile Coals, 1927

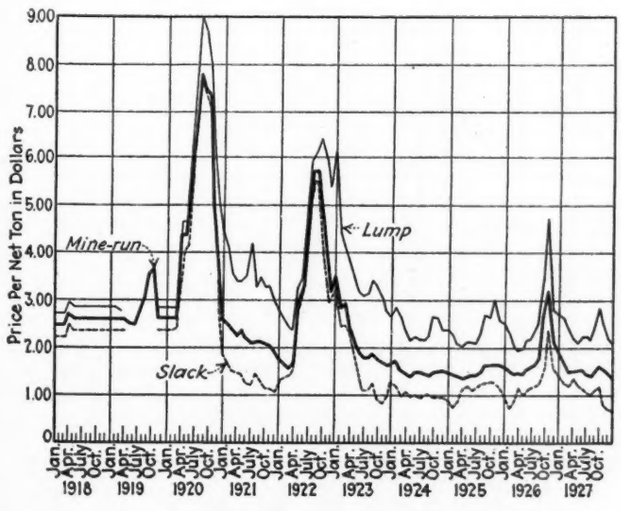
Average of Quotations on Columbus and Cincinnati Markets

Month	Lump	Run of Mine	Screenings	Weighted Av. All Sizes
January	$2.62	$1.69	$1.29	$1.89
February	2.40	1.50	1.24	1.72
March	2.19	1.52	1.36	1.69
April	2.14	1.53	1.25	1.66
May	2.25	1.54	1.21	1.69
June	2.25	1.47	1.08	1.63
July	2.16	1.43	1.00	1.57
August	2.47	1.49	1.12	1.71
September	2.84	1.62	1.14	1.89
October	2.54	1.55	.82	1.71
November	2.19	1.49	.72	1.55
December	2.11	1.36	.70	1.46
Yearly average	$2.35	$1.52	$1.08	$1.68

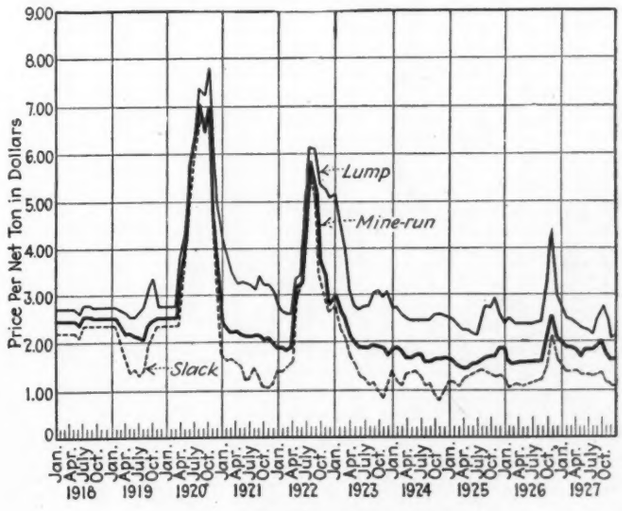
Spot Prices, F.o.b. Mines, Hocking District (Ohio) Coal, 1927

Columbus Market

Month	Lump	Run of Mine	Screenings	Weighted Av. All Sizes
January	$2.52	$1.88	$1.38	$2.08
February	2.47	1.88	1.38	2.06
March	2.38	1.83	1.39	2.00
April	2.28	1.69	1.30	1.89
May	2.25	1.82	1.30	1.92
June	2.25	1.83	1.29	1.93
July	2.16	1.83	1.27	1.89
August	2.49	1.90	1.34	2.07
September	2.75	2.00	1.36	2.23
October	2.49	1.73	1.20	1.99
November	2.07	1.63	1.13	1.85
December	2.13	1.63	1.13	1.87
Yearly average	$2.35	$1.80	$1.29	$1.98



Kanawha District Spot Prices



Hocking District Spot Prices

Progress in Competitive Adjustment Improves Outlook in Pittsburgh

By B. E. V. Luty

DURING the last year the Pittsburgh district and the Connellsville region came closer together from a trade standpoint. Extension of the Connellsville region to the south brought it into contact with northern West Virginia, while the shipment of both Connellsville and Pittsburgh coal for by-product coking brought those two fields together. Both mine the Pittsburgh seam, but in the Connellsville region the seam is thicker and the coal softer.

A very important development of 1927 was the Pittsburgh district becoming non-union, as the Connellsville region had been since 1891, thus setting up another point of contact. In several respects western Pennsylvania is now a homogeneous territory.

During the year western Pennsylvania was brought into closer trade relationship with West Virginia by the Interstate Commerce Commission granting, after years of effort on the part of the Pittsburgh district, reductions in freight rates on coal to Lake Erie ports.

The year opened with a burden of high wages on the operators, caused by the coal scarcity of October, 1926, which arose largely from the British coal strike and the heavy American export movement. The Pittsburgh Coal Co., under stress, had advanced wages in the open-shop operations it had begun instituting in August, 1925, to rates a shade above those of the Jacksonville scale, and the Connellsville region had immediately followed with an advance to the Frick scale. Both scales were essentially $7.50 basic day rate scales.

Weeks before the end of 1926 the edge had come off the market completely. At the beginning of January, 1927, Pittsburgh ¾-in. gas lump was $2.50@$2.75 in the open market, with steam mine-run $2@$2.25. The $7.50 scale became untenable again, and on Jan. 19 the Pittsburgh Coal Co. announced a reduction to substantially a $6 scale. The Connellsville region was plainly in line to go back to the $5 scale it had paid for years up to the time of the British disturbance, but one of the operators—W. J. Rainey, Inc.—immediately reduced to a $6 basis and other operators were virtually deprived of choice.

There was only a fair market for western Pennsylvania coal in the first three months of 1927, preceding the strike date. Union operators—the Pittsburgh Coal Co. was already on an open-shop basis—declared for open-shop operations, but made no effort for several months to resume production, market conditions being so unfavorable. Numerous truck mines signed provisional arrangements with the United Mine Workers whereby they continued to produce for their local trade. As the months of the suspension passed open-shop resumptions occurred, conspicuous cases being the Jones & Laughlin Steel Corporation, which had accumulated about 2,000,000 tons of stocks by April 1, and the Pittsburgh Terminal Coal Corporation, which early in November reduced to the November, 1917, scale of approximately $5.

Following the Illinois settlement of Oct. 1 marketing conditions became still poorer, and it was wholly a question of selling coal, there being no question about ability to produce all that could be sold.

Improvement in substantially the whole western Pennsylvania coal trade in the new year is virtually unavoidable. Stocks being fairly well liquidated and consumption running heavier both by reason of winter and increasing industrial activity assured for the first three or four months of the year, there will be a broader market and prices should at least stiffen if not advance measurably.

Spot Prices, F.o.b. Mines, of Pittsburgh District (Pennsylvania) Coal, 1927

PITTSBURGH MARKET

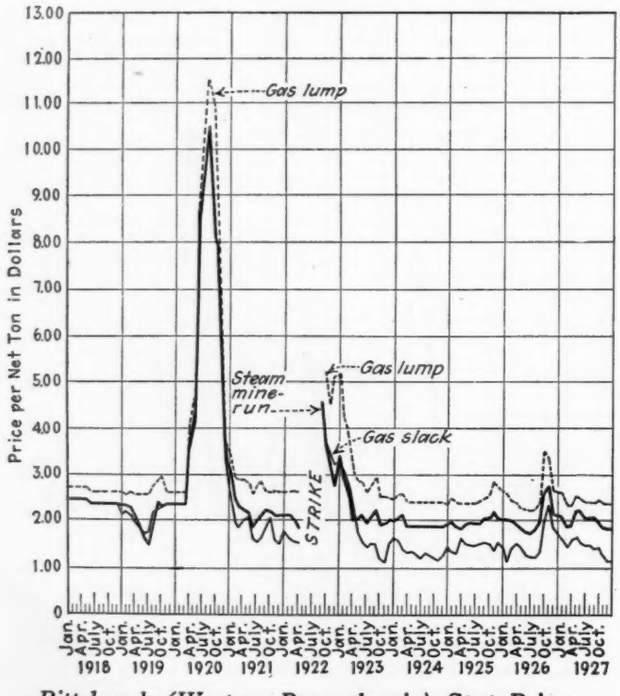
Month	Lump	Run of Mine	Screenings	Weighted Av. All Sizes
January	$2.58	$2.06	$1.61	$2.10
February	2.53	1.87	1.45	1.90
March	2.35	1.90	1.62	1.95
April	2.53	2.20	1.68	2.16
May	2.49	2.21	1.53	2.09
June	2.40	2.02	1.49	2.01
July	2.40	2.03	1.50	2.01
August	2.39	2.04	1.42	1.99
September	2.45	1.96	1.47	1.98
October	2.39	1.85	1.29	1.87
November	2.38	1.83	1.15	1.32
December	2.38	1.83	1.15	1.32
Yearly average	$2.42	$2.06	$1.45	$1.89

Spot Prices, F.o.b. Mines, Pittsburgh No. 8 (Ohio) Coal, 1927

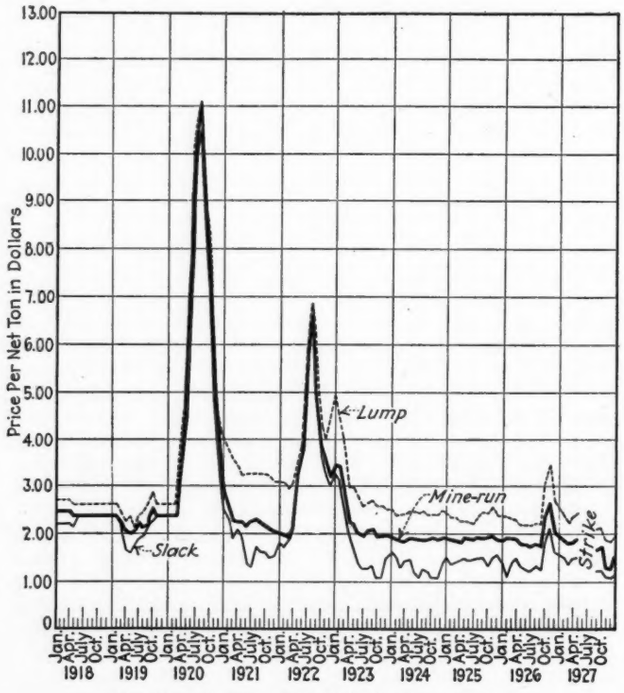
CLEVELAND MARKET

Month	Lump	Run of Mine	Screenings	Weighted Av. All Sizes
January	$2.38	$1.89	$1.52	$2.00
February	2.23	1.78	1.39	1.88
March	2.32	1.82	1.50	1.95
April	2.40	1.90	1.52	2.02
May	*	*	*	*
June	*	*	*	*
July	*	*	*	*
August	2.13	1.66	1.23	1.76
September	2.15	1.73	1.25	1.80
October	1.89	1.30	1.10	1.48
November	1.85	1.28	1.08	1.45
December	1.94	1.53	1.15	1.61
Yearly average	$2.14	$1.65	$1.30	$1.77

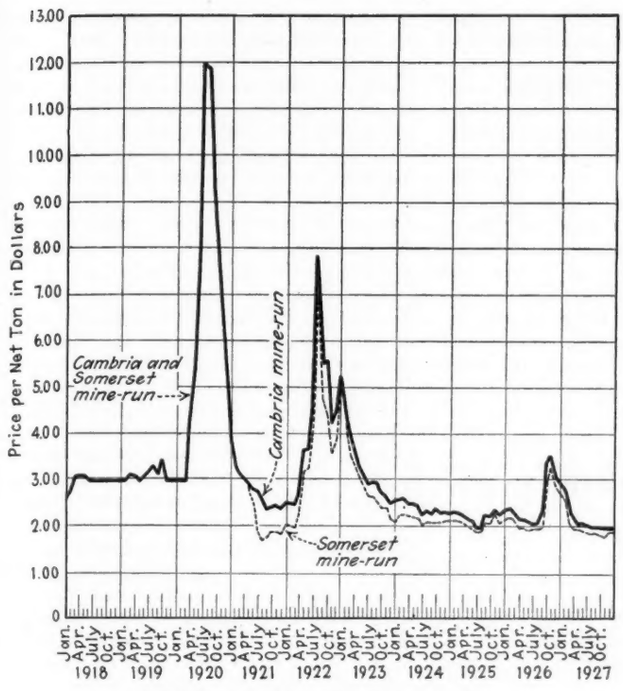
* Quotations withdrawn because of strike.



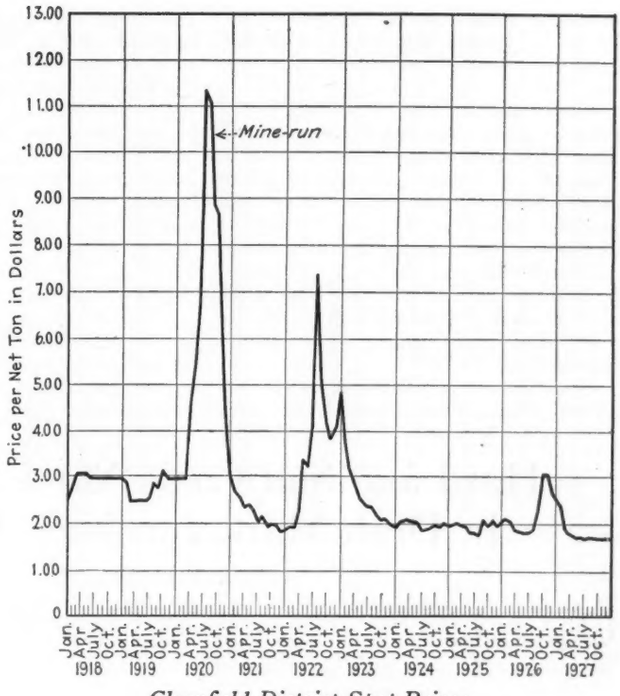
Pittsburgh (Western Pennsylvania) Spot Prices



Pittsburgh No. 8 (Ohio) Spot Prices



Cambria and Somerset Spot Prices



Clearfield District Spot Prices

Dispirited Trade in New England Has Discouraging Outlook

By G. G. Wolkins

THE labor troubles predicted for 1927 proved only of negligible effect on bituminous coal in New England. Not only was there abundant supply but prices declined from the day the strike began; in fact, prices shrank to lower levels even than in 1925. And to stress further the strange behavior of the market in a "strike year," receipts far exceeded those of 1926 and were well up to the marks of 1925.

Quite evident too is the increasing volume moving here on contract. There is a steady flow through accustomed channels that discourages spot activity, and both sales agencies and buyers are more and more inclined to make commitments over long periods. The steam trade is in fewer hands than even two years ago, and it is now accepted practice to fix a month-by-month price based on the cost of mining but with a stipulated maximum.

Spot prices are not, therefore, an accurate index of mine returns, and if in 1927 the New England day-to-day market was a picture of unrelieved gloom it is more a reflection on those interests who chose not to make price commitments early in the season.

For inland delivery also there is more tonnage sold on season contracts through factors owning their own terminals and closely allied with producing companies. There was, therefore, a greater stabilizing influence than appeared in other years, although the considerable tonnage forced on the Providence, Boston and Portland markets by shippers relying wholly upon railroad rehandling facilities leaves room for progress in this direction.

Beginning in April prices generally were much depressed. A minimum railroad toll of $2.52 from smokeless mines to tidewater allows but discouraging return to the operator whose mine-run sells in the spot market for prices bordering on $4 f.o.b. vessel, and it remains to be seen how long such a situation will continue. In time there will be economies, but the transition bears heavily on many of the producing interests.

All-rail tariffs temporarily in effect from the West Virginia smokeless districts because of anthracite shortages were tentatively decided upon in September, giving access to a market here for prepared sizes. A considerabl tonnage has been absorbed, especially for New Haven R.R. destinations where the differential is but $1.25 more than the minimum Clearfield rate, but mine-run bituminous, coke, oil, and gas remain the chief contenders for the crown so long worn by anthracite.

Observers have said the reduced receipts of domestic size anthracite—in some cases as high as 25 to 30 per cent as compared with 1926 figures—can be attributed about half to the increased number of people buying coal in small lots as they need it and about half to substitutes, but at the end of the year it was being realized that briquets, ovoids, Welsh anthracite and German anthracite have in addition put weight into the scale and that Pennsylvania anthracite producers must recognize this competition and put their houses in order.

A month by month review of the steam coal market in 1927 would be monotonous—months of light inquiry, ample reserves, curtailed output, and moderate prices, steadily yielding to the pressure to sell. Hampton Roads quotations in January eased from $5.25 to $5 flat, and by the end of March $4.20 was the low point for No. 2 Pocahontas and New River, the figures in each case representing gross tons f.o.b. vessel. Steam users were fairly consistent in buying for storage in anticipation of wage difficulties, and this continued until in April the strike scare was so thoroughly discounted that buyers took their own time and began to lose interest.

New England spot business dragged heavily from the beginning of May. The few consumers in the market waited placidly for "dips," and the agencies that had resolved to base their sales on current demand were obliged to exercise drastic control over output. The spot market sagged, as in old times in midsummer, and those caught with distress coal were obliged to accept as low prices as have been heard in five years.

Spot Prices, F.o.b. Mines, Mine-Run Coal, From Cambria, Somerset and Clearfield Districts, 1927

Boston Market

Month	Cambria	Somerset	Clearfield
January	$2.74	$2.54	$2.41
February	2.28	2.09	1.93
March	2.15	1.96	1.83
April	2.04	1.94	1.80
May	2.07	1.87	1.73
June	2.03	1.86	1.76
July	1.99	1.84	1.73
August	2.00	1.85	1.75
September	1.99	1.83	1.74
October	1.98	1.80	1.73
November	1.97	1.88	1.73
December	1.97	1.88	1.73
Yearly average	$2.10	$1.95	$1.82

Hampton Roads prices slumped to the $4 mark. Slack sold down to $3 and even less f.o.b. vessel—almost a pre-war basis.

From Boston and Providence the price of Navy Standard Pocahontas and New River for inland delivery receded from $7 in January to around $5 in November. Factors having their own facilities tried to set $5.35 as a minimum during October, but the pressure of unmarketed coal was too great. At retail in Boston the net ton delivered price was gradually hammered down to $8, even lower prices being made to certain institutions.

Clearfields, Cambrias and Somersets all-rail from central Pennsylvania were featureless throughout 1927. Restricted more and more, except for special uses, to a narrow margin of territory east of the Connecticut River, the all-rail coals were dominated by smokeless output throughout tidewater territory. A very small tonnage came forward rail-and-water from Philadelphia and New York loading ports. Prices were modified during the year from $2.65 for No. 1 Navy Standard in January down to $2.10 for the same grade through the months from July to December.

To 1928 the trade can hardly look for much encouragement. The tonnage used is not likely to show any material increase, and present storage piles are admittedly large.

Hard and Soft Coals Move Slowly In Drab Market at New York

By R. W. Morris

OUTSTANDING features were lacking in the New York coal market for 1927. Both anthracite and bituminous coals moved slowly, and while soft-coal users were well supplied with coal, the domestic hard coals were hard hit by the introduction of oil burners throughout Greater New York.

The bituminous market began as and remained a buyers' market practically throughout the twelve months. Consumers paid almost no attention to the strike in the union mines which continued in force for three-quarters of the year, feeling secure in the ability of the non-union mines to supply all the coal needed. Reserves were large at the beginning of the year and continued to be so. Soft coals moved slowly but producers of the better grades found no trouble in moving their product easily, although quotations were low and at times sales were said to have been made below current quotations.

It was early in March following the announcement of producers of a reduction in mine prices before the buying of anthracite showed any activity. The year started with domestic coals moving slowly. Temperatures were against heavy consumption and many mines were either idle or curtailing output. No. 1 buckwheat held the boards in the local market. It was in heavy call and because of lower output was growing scarce. Then followed a sudden spurt in egg and pea, which was later followed by a couple of producers advancing the price of pea from $6 to $6.50. Independent No. 1 buckwheat was quoted close to $5, but retail dealers hesitated considerably before paying that figure.

Buckwheat soon gained in volume, however, due to washery output, and the shortage was further relieved by the substitution of bituminous coal by some railroads for No. 1 buckwheat.

The first announcement of reductions was made public on March 1 when a couple of producers stated that prices for egg, stove and chestnut would be cut 10c. to 25c. per ton. This was followed a couple of weeks later by reductions by other producers.

Meanwhile independent producers felt the lack of buying and their quotations, which had been in many instances more than company prices, took a drop.

The market showed much improvement by April 15 and with lower temperatures producers found orders plentiful. By the end of the month many shippers had all the orders they could conveniently handle and in some instances were refusing orders for pea coal.

May found the market in still better condition. Movement was better and mines were reopening.

Increases in mine prices announced by the operators on June 1 had been discounted largely by dealers and consumers, especially the former, who had in most instances filled their bins, and there was slower buying.

Buying fell off to such an extent in June that some of the operators were sending coal to the storage piles before the month was half gone. Steam coals, which had been moved without much trouble, were slipping.

The summer business was quiet. There were no indications that business would pick up until fall and this remained the fact with the exception of the demand for buckwheat No. 1 which was strong due to the curtailed mining. Domestic coals continued to limp throughout the summer. Retail yards were filled and shippers received cancellations and requests to withhold shipments pending further instructions.

Buyers began to show interest in the situation early in August because of the anticipated advance in mine prices scheduled for Sept. 1. Stove was the first size to show better movement. The steam sizes were moving well and the birdseye was hard to obtain.

A better market was in evidence early in September, following the new mine prices announced by the producers. While the demand for the domestic coals was better than in August it was not heavy and was far below normal.

The betterment in the market did not continue long. Within a couple of weeks the market became quiet so far as local conditions were concerned.

There was no increased activity during the balance of the year. The market fluctuated slightly at times occasioned

Average Prices of Bituminous Coals at New York by Months in 1927

	Pools				
	1	9	10	11	34
January	$3.10-$3.50	$2.40-$2.70	$2.10-$2.50	$1.85-$2.20	$1.50-$1.75
February	2.85- 3.25	2.10- 2.50	1.80- 2.25	1.50- 2.00	1.35- 1.75
March	2.75- 3.25	2.15- 2.45	1.80- 2.20	1.60- 1.90	1.30- 1.65
April	2.75- 3.10	2.00- 2.25	1.65- 1.90	1.50- 1.75	1.35- 1.60
May	2.50- 3.00	1.90- 2.25	1.65- 1.90	1.50- 1.75	1.35- 1.60
June	2.50- 2.75	1.90- 2.15	1.65- 1.90	1.50- 1.75	1.35- 1.60
July	2.50- 2.75	1.90- 2.15	1.60- 1.90	1.50- 1.75	1.35- 1.60
August	2.50- 2.75	1.90- 2.20	1.65- 1.90	1.50- 1.80	1.35- 1.55
September	2.50- 2.75	1.90- 2.25	1.65- 1.90	1.50- 1.75	1.35- 1.60
October	2.35- 2.75	1.85- 2.25	1.60- 1.90	1.50- 1.75	1.35- 1.60
November	2.35- 2.75	1.90- 2.25	1.65- 1.90	1.50- 1.75	1.25- 1.60
December	2.35- 2.75	1.90- 2.25	1.65- 1.90	1.50- 1.75	1.25- 1.60

Average Monthly Quotations for Independent Anthracite In New York Market in 1927

	Egg	Stove	Chestnut	Pea
January	$8.55-$9.00	$8.90-$9.50	$8.75-$9.25	$6.00-$6.80
February	8.30- 8.70	8.70- 9.10	8.30- 8.25	6.15- 6.55
March	8.25- 8.55	8.45- 8.90	8.15- 8.55	6.00- 6.50
April	8.00- 8.40	8.50- 8.85	8.00- 8.35	5.85- 6.50
May	8.25- 8.50	8.55- 8.90	8.25- 8.50	5.55- 6.25
June	8.25- 8.50	8.75- 9.10	8.25- 8.50	5.45- 6.20
July	8.25- 8.50	8.75- 9.25	8.00- 8.55	5.50- 6.00
August	8.25- 8.55	8.75- 9.25	8.05- 8.55	5.50- 6.05
September	8.50- 8.75	8.85- 9.30	8.50- 8.75	5.70- 6.25
October	8.40- 8.75	9.00- 9.50	8.50- 8.75	5.75- 6.25
November	8.40- 8.75	9.00- 9.50	8.75- 9.00	5.55- 6.25
December	8.30- 8.75	9.00- 9.35	8.75- 9.00	5.50- 6.00

	No. 1 Buckwheat	Rice	Barley	Birdseye
January	$3.50-$4.00	$1.95-$2.35	$1.45-$1.65	$1.35-$1.65
February	3.55- 4.05	2.00- 2.25	1.35- 1.55	1.60- 2.00
March	2.70- 3.10	1.85- 2.15	1.25- 1.50	1.60- 1.85
April	2.65- 3.00	1.80- 2.00	1.20- 1.50	1.35- 1.60
May	2.65- 2.85	1.70- 1.80	1.20- 1.50	1.40- 1.60
June	2.25- 2.55	1.65- 1.90	1.10- 1.50	1.30- 1.55
July	2.65- 3.00	1.75- 2.00	1.15- 1.55	1.30- 1.60
August	3.25- 3.75	1.90- 2.25	1.40- 1.70	1.60- 1.85
September	3.15- 3.50	1.85- 2.05	1.45- 1.65	1.50- 1.80
October	2.90- 3.25	1.80- 2.25	1.35- 1.60	1.50- 1.60
November	2.80- 3.05	1.80- 2.15	1.35- 1.60	1.45- 1.60
December	2.70- 3.00	1.90- .215	1.40- 1.60	1.50- 1.60

by a few days of lower temperatures during which individual sizes were affected, but there was no continued activity. Steam coals regained their lost strength.

In the soft-coal market "buy at your own price," the accepted slogan at the beginning of the year, seems to have remained in vogue throughout the twelve months. This was due to the supply of coal above ground, a comparatively mild winter and the heavy reserves carried by consumers from the previous twelve months. Prices were low but not low enough to induce added buying.

Before the new year was a month old the market showed a little more activity. Labor trouble loomed and weather conditions became more seasonable. Coal moved freer and there was a feeling that the market was on the upgrade. While movement was better bargain hunters were numerous and prices showed no betterment.

The big interests were much in evidence taking in large supplies at the current quotations while the smaller consumer with limited storage facilities kept his reserves intact. Because of the scarcity of No. 1 buckwheat and the high prices quoted for independent product many of its users took to the use of soft coal.

Early in February some local houses received inquiries regarding contracts to run for fourteen months, quotations ranging from $2.35 for non-union to $3.25 for union coals, for the better grade. Quiet buying in large volume continued throughout February and early March. Railroads, public utilities and the larger industries took in considerably more than their contracts called for while the smaller consumers maintained their usual reserve stocks.

Instead of the strike having a stimulating effect on the local situation its effect was the reverse. Consumers were supplied with sufficient coal to meet their needs and prices, instead of advancing, became lower. It was a matter of debate as to whether the mines were closed because of the expiration of the working agreement or lack of orders.

The market continued slipping through May. Free-coal buyers generally did business over the bargain counter. At times inquiries increased, but orders remained scarce. Although output had decreased there was more than enough coal to go around. At various times during the summer shippers hoped for better conditions, but they were disappointed.

Inquiries regarding contracts were numerous during August and September but sellers preferred to take chances with the spot market rather than tie up their output in view of the uncertainty of the labor situation.

Shippers continued to have difficulty in securing new orders throughout the balance of the year. Coal was plentiful and contract holders took their full quotas but did not show any desire to increase these tonnages. Shippers of the better grades claimed to be well sold up for these coals at all times.

Anthracite in Doldrums, Bituminous Nearly as Bad, in Philadelphia

By William D. Hammer

ANTHRACITE had one of the most unsatisfactory periods in its history last year at Philadelphia. From the beginning the weather was mild and demand was quieter than usual—so weak was the market that independent shippers occasionally cut prices to move tonnage. As the season wore on this practice spread, and in February many mines were working only half time.

The only bright spot in the trade during the winter was the strength shown by steam sizes. Due to educational work in the use of No. 1 buckwheat this size sold in the open market up to April at $3.25@$3.75, compared with a contract price of $2.50.

With the announcement of reduced company prices as of April 1 it was decided to make an advance of 25c. on June 1 and on Sept. 1 instead of adding 10c. per month. This proposal was made in mid-March, whereupon independent shippers immediately began selling their output for the balance of the month at the April company circular. In self-defense the companies adopted the same plan.

On account of the curtailment of early buying some retailers began to cut prices in order to obtain business. When autumn came the temperature remained so mild until the middle of December that many more dealers pared prices—at times as much as $1 below the normal line-up.

Bituminous also had far from a happy time. January opened with the market losing ground following the short boom due to the British strike. Spot prices at this time averaged about as follows: Pool 1, $3@$3.20; pool 9, $2.45@$2.65; pool 10, $2.25@$2.45; pool 11, $2@$2.20; pools 54 and and 64, $1.50@$1.65.

Despite the imminence of a strike, prices slowly declined until about June, when the spot schedule was: Pool 1, $2.50@$2.75; pool 9, $1.80@$2.25; pool 10, $1.60@$1.85; pool 11, $1.50@$1.70; pools 54 and 64, $1.30@$1.65. The market held at about these figures for the balance of the year. It was noticeable, too, that the best business was enjoyed by producers of top-notch grades of coal, and they were quite busy at most times.

The effect of the strike on the trade, however, was nil, with non-union production sufficient to meet the needs of the market and steadily increasing. After April 1 demand actually fell off, as consumers resorted to stockpiles, confident that coal could be had whenever needed.

With the coming of autumn there was a slight increase in demand, but declining industrial activity held back consumer buying except for current needs. Nevertheless central Pennsylvania producers continued to open up on a non-union basis. Though their efforts have been vigorously opposed by union elements progress in this direction continues.

The immediate outlook is not encouraging. Demand for increased tonnage, with prices that will yield a reasonable profit, is wholly dependent upon an improvement in the industrial situation.

Baltimore Prices Low Due to Oversupply

By W. R. Hough

FEW regrets were felt in the Baltimore soft-coal trade with the passing of 1927 into history. There were a few spurt periods, it is true, but as a whole the twelve-month was one of oversupply—despite strike complications in some districts—limited demand and poor prices. Competition in selling was so keen throughout almost every month of the year that operators, agents and jobbers were seeking trade outlets rather than having purchasing agents and other consumers actively seeking coal.

The export trade showed a distinct falling off from the preceding year. Total loadings will not exceed 350,000 tons cargo and 30,000 tons bunkers.

January saw industries moving in moderate fashion in this district and prices comparatively low. At this time pool 1 was $2.50@$2.75; pool 9, $2.05@$2.25; pool 10, $1.85@$2; pool 18, $1.75@$1.80; pools 54 and 64, $1.50@$1.60.

February saw a little stiffening to the market, apparently due to the approaching strike with the end of the Jacksonville agreement. Prices were up 5@10c. a ton over January on most grades. The export business went dead during that month.

In March the trade adopted the policy of watchful waiting and prices showed little fluctuation. Despite the start of the strike in April, the market was absolutely colorless and the price list drifted on with little material change.

During May excellent pool 71 was available at $2.10@$2.25; pool 9, $1.75@$1.85; pool 10, $1.60@$1.70; pool 11, $1.50@$1.60; pool 63, $1.65@$1.75; pool 64, $1.45@$1.55, and pool 34, $1.30@$1.40.

June saw the railroads and industries living on stored stocks and with little real demand. Prices continued constant, with the exception of the last part of the month, when better grade coals advanced about 10c. per ton. July was pretty well a repetition of the month of June in both domestic trading and on exports. Another hard drive on selling featured August, with the purchasing end still shy. Prices showed but slight fluctuations.

September brought some renewal of activity to the trade and a number of

purchasing agents got in the field for a time. Quotations to the trade jumped 20 to 25c. on better grades and 10 to 15c. on weaker grades of steam coals and on gas coals.

October brought another lull in home buying, although prices, if anything, were a little stronger, pool 1 selling at $2.60@$2.70 and pool 9 $2.10@$2.35. Lower grades also showed slightly increased strength.

November was very mild and trading was much the same. Prices, even for best grade coals, slid off 15c. per ton and lower grades became a drug on the market. Exports again lagged as compared with previous years.

December saw a still further drop in demand in the home market and in prices. The year closed with excellent coals offered cheap and poor coals in little demand. Pool 71 was quoted at $2.30@$2.40; pool 9, $1.90@$2; pool 10, $1.70@$1.80; pool 11, $1.55@$1.65; pool 63, $1.65@$1.85; pool 64, $1.45@$1.55, and pool 34, $1.30@$1.40.

In the hard-coal business the year was marked by moderate buying during the spring and summer season, despite urging of dealers that consumers put in the usual stocks. Whether it was lack of cash or decision to await cold weather before buying coal, the fact remains that fall came around with only about 60 per cent of the usual amount of hard coal in cellars in Baltimore.

October, November and December were all very mild months and this encouraged many consumers to take coal only in small lots. The result was that on the first day of the new year many cellars in Baltimore were carrying light supplies. While this made a poor year for the hard-coal merchants, it probably will mean a busy January and February if the weather is cold.

Spot Prices, F.o.b. Mines, of Big Seam (Alabama) Coal, 1927

BIRMINGHAM MARKET

Month	Lump	Run of Mine	Washed
January	$2.68	$1.88	$1.98
February	2.63	1.75	2.00
March	2.47	1.75	2.00
April	2.13	1.75	2.00
May	2.15	1.68	1.88
June	2.28	1.70	1.88
July	2.13	1.80	1.93
August	2.18	1.83	1.95
September	2.38	1.83	1.95
October	2.35	1.86	1.95
November	2.31	1.83	1.96
December	2.38	1.83	1.95
Yearly average	$2.34	$1.79	$1.95

Alabama Holds Output to Demand in Quiet But Fairly Satisfactory Year

By H. B. McLaurine

THE Alabama market followed a quiet and uneventful course during 1927. There were few instances in which buying of either commercial or domestic fuel extended beyond a semi-active stage. Industrial conditions in regular territory were not as favorable as in the preceding year and there was no outside demand of consequence. Taking these factors into consideration the volume of trade was fairly satisfactory.

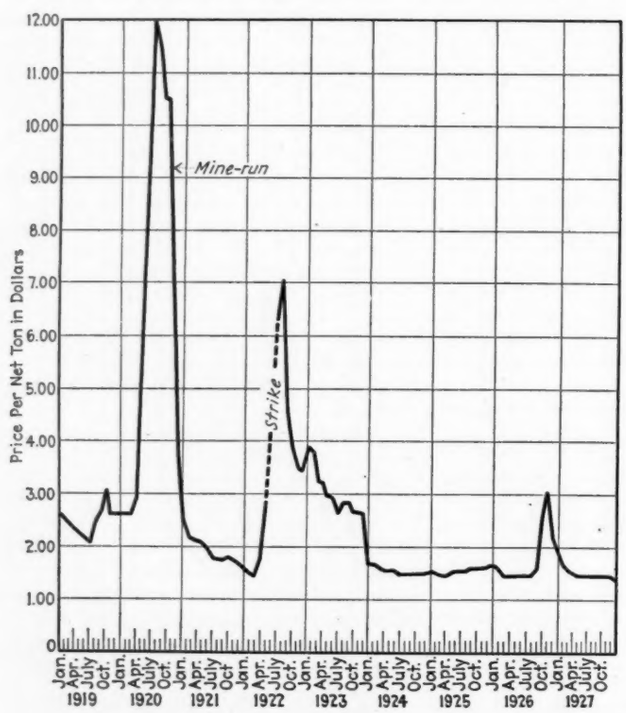
Sales in the spot market were restricted pretty closely to the immediate needs of consumers, and such reserves as were created and maintained were of modest proportions. During the first quarter the railroads and other utilities stocked some fuel as a precaution against possible eventualities growing out of the strike in the Central Competitive Field, and this procedure also was followed to a limited extent by some industrial consumers, who took deliveries on contracts somewhat in excess of current consumption. Industrial contracts and those of the carriers, practically all of which expired in the second and third quarters, were renewed with little or no change in price or tonnage basis, and deliveries on such agreements were accepted on a moderately good basis during this period. Spot buying continued light and on a hand-to-mouth order.

Near midsummer an active inquiry developed in Mississippi Valley territory, sections of Arkansas and points in the Middle West as a result of the prolonged and unsuccessful wage parleys in the Central Competitive Field, from which these sections had been principally supplied with fuel. A large amount of steam and some domestic tonnage was sold for delivery over a period of six to eight weeks and several of the Western rail lines made purchases of additional coal to supplement contract deliveries.

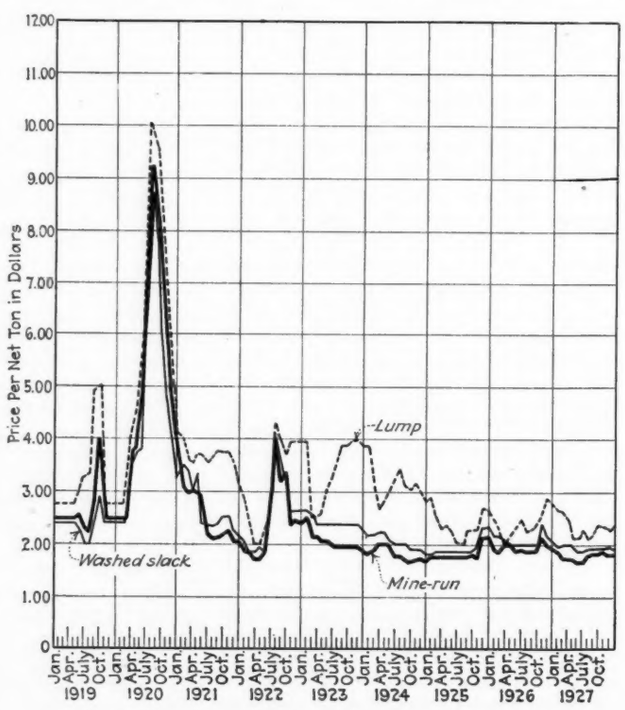
Spot Prices, F.o.b. Mines, of Fairmont District (W. Va.) Coal, 1927

PHILADELPHIA MARKET

Month	Mine-Run	Month	Mine-Run
January	$1.65	August	$1.47
February	1.56	September	1.47
March	1.48	October	1.47
April	1.47	November	1.47
May	1.47	December	1.38
June	1.47		
July	1.47	Yearly average	1.49



Fairmont District Spot Prices



Alabama District Spot Prices

Average Range of Steam Coal Prices at Birmingham in 1927

	January, 1927			April, 1927		
	Mine-run	Washed	Lump	Mine-run	Washed	Lump
Big Seam	$1.50@$2	$1.75@$2.25	$2.50@$2.75	$1.50@$2	$1.75@$2.25	$1.75@$2.25
Carbon Hill	1.75@ 2.25	1.75@ 2.25	3.25@ 3.50	1.75@2	1.75@ 2.25	2.50
Cahaba	2.25@ 2.50	2.00@ 2.50	4.75@ 6.00	2.25@ 2.50	2.00@ 2.50	3.50@ 4.00
Black Creek	.....	2.50@ 3.00	5.00@ 5.25	.....	2.25@ 2.75	3.75
Corona	2.75	3.00	4.00	2.25	2.50	2.75
Pratt	2.00@ 2.25	2.00@ 2.25	.....	1.85@ 2.10	2.00@ 2.25	.....
Montevallo Seams	.....	.....	5.50@ 6.25	.....	.....	4.25@ 4.75

	September, 1927			December, 1927		
	Mine-run	Washed	Lump	Mine-run	Washed	Lump
Big Seam	$1.65@$2.00	$1.75@$2.15	$2.25@$2.50	$1.65@$2.00	$1.75@$2.15	$2.00@$2.50
Carbon Hill	1.75@ 2.00	1.75@ 2.25	3.25	1.75@ 2.00	1.75@ 2.25	3.25
Cahaba	2.25	2.00@ 2.25	4.50@ 5.00	2.25	2.00@ 2.25	4.50@ 5.00
Black Creek	.....	2.25@ 2.75	4.75	.....	2.25@ 2.75	5.00
Corona	2.25	2.50	3.50	2.25	2.50	3.50
Pratt	1.85@ 2.00	2.00@ 2.25	.....	1.85@ 2.00	2.00@ 2.25	.....
Montevallo Seams	.....	.....	5.25@ 5.75	.....	.....	5.50@ 6.00

During the balance of the year the spot market was weak and draggy and the movement on contracts was on the minimum basis allowed. Accumulation of reserves for the holidays was not indulged in to any appreciable extent, the carriers being well stocked and industrial plants also in a safe position in this respect. About the normal amount of coking coal was consumed in the district. The bunker trade was quiet and the volume of business subnormal.

Unseasonable weather had a demoralizing effect on the sale of domestic coal. During the customary cold weather periods there were only a few days on which freezing temperatures prevailed, the weather mostly being mild, requiring little fuel for house heating.

Foundry coke was in fairly good demand the entire year, the market weakening slightly during the last two months. Quotations of $6 for spot and $5.50 for contract tonnage held firm until November, when there was a decline, the range being $5 to $5.50 per ton. Domestic sizes were not bought very actively at any time. Prices ranged $4.25 to $5.25 at the beginning of the year, showing a decline during the last quarter, when quotations of $4 to $4.50 per ton prevailed. Lack of any appreciable amount of cold weather caused a light demand.

Canada's Industrial Growth Reflected In Expansion of Coal Industry

By S. J. Cook

Chief of Mining, Metallurgical and Chemical Branch, Dominion Bureau of Statistics, Ottawa, Canada

CANADA's coal consumption increased during 1927 by nearly two million tons, and as the gain was wholly in fuel for industrial purposes, the greater tonnage reflected, in some measure, the advance in factory, mine and mill activity that took place during the year. More coal was mined in Canada last year than in 1926 or any other year except 1923 and 1920. At the same time more coal was imported into Canada than in any other year since 1923. Exports were normal at about one million tons.

Preliminary figures for 1927 show a coal output from Canadian mines of 16,722,126 net tons, as against 16,478,131 tons in 1926.

Exports of Canadian coal during the year amounted to 1,095,139 tons, as compared with 1,028,200 tons in 1926.

Imports reached 19,618,077 tons, including 18,565,718 tons from the United States, 1,037,245 tons from Great Britain, 9,636 tons from Germany, 5,155 tons from the Netherlands, and 323 tons from Japan.

The apparent consumption of coal in Canada during 1927, obtained by adding production and imports, and deducting exports, has been computed at 35,245,064 tons. In the preceding year the total coal available for consumption was 33,506,070 tons, and the actual consumption was determined as 32,015,386 tons.

With one or two minor exceptions, prices of Canadian coal at the mine were a little lower in 1927 than in 1926; for the whole of Canada the drop averaged only about 3c. a ton. Lignite sold for an average price of $2.82 a ton at the mine; Saskatchewan lignite sold for $1.81 while Alberta lignite brought an average of $2.96. Bituminous coal brought $3.84 on the average. Nova Scotia's average rate was $3.91; New Brunswick, $4.33; Alberta, $3.48, and British Columbia, $3.99 for the year.

A feature of the year's coal import business was the receipt of more than a million tons from Great Britain. Never before had so great a tonnage been brought to Canada from that source.

In 1926 imports of anthracite from the United States totaled 3,883,242 tons and from Great Britain, 272,170 tons, which with 87,520 tons from other countries made a total of 4,242,932 tons. In 1927 the distribution showed 3,307,296 tons from the United States, 882,251 tons from Great Britain and 14,791 tons from other countries, making a total of 4,204,338 tons.

Output, Imports, Exports and Apparent Consumption of Coal in Canada, 1926 and 1927

(In Net Tons)

	1926	1927
OUTPUT		
Bituminous	12,393,079	12,769,814
Sub-bituminous	489,736	545,874
Lignite	3,595,316	3,406,438
Total	16,478,131	16,722,126
IMPORTS		
Anthracite		
Egg, nut, etc.	3,914,109	3,863,373
Dust	328,823	340,965
Total anthracite	4,242,932	4,204,338
Bituminous	13,802,242	15,403,514
Lignite	10,965	10,225
Total imports	18,056,139	19,618,077
EXPORTS		
Bituminous	1,028,200	1,095,139
APPARENT CONSUMPTION		
Anthracite		
Egg, nut, etc.	3,914,109	3,863,373
Dust	328,823	340,965
Total anthracite	4,242,932	4,204,338
Bituminous	25,167,121	27,078,189
Sub-bituminous	489,736	545,874
Lignite	3,606,281	3,416,663
Total	33,506,070	35,245,064

Data for 1927 subject to revision.

Imports of Coal Into Canada, by Kinds, 1926 and 1927

(In Net Tons)

	Country Whence Imported	Tonnage Imported 1926	1927
Canada			
Anthracite	United States	3,883,242	3,307,296
	Great Britain	272,170	882,251
	Germany	49,718	9,636
	Netherlands	37,802	5,155
Bituminous	United States	13,797,935	15,248,197
	Great Britain	3,904	154,994
	Netherlands	100	.....
	Japan	303	323
Lignite	United States	10,926	10,225
	Great Britain	39	.....
Total, all grades	United States	17,692,103	18,565,718
	Great Britain	276,113	1,037,245
	Germany	49,718	9,636
	Netherlands	37,902	5,155
	Japan	303	323
Grand total		18,056,139	19,618,077

Data for 1927 subject to revision.

Output and Value of Coal from Canadian Mines, 1926-1927

	1926			1927		
Provinces	Net Tons	Value	Average Value Per Ton	Net Tons	Value	Average Value Per Ton
Nova Scotia	6,747,477	$26,845,226	$3.97	7,035,938	$27,532,218	$3.91
New Brunswick	173,111	710,245	4.10	200,924	870,040	4.33
Saskatchewan	439,803	819,805	1.86	406,370	737,388	1.81
Alberta—						
Bituminous	2,858,456	9,984,386	3.49	2,900,064	10,083,107	3.48
Sub-bituminous	489,736	1,458,116	2.97	545,874	1,636,031	2.99
Lignite	3,155,513	9,443,601	2.99	2,999,940	8,872,778	2.96
Total Alberta	6,503,705	20,886,103	3.21	6,445,878	20,591,916	3.19
British Columbia	2,613,719	10,612,915	4.06	2,632,888	10,526,341	3.99
Yukon	316	800	2.53	.....	.....	....
Canada						
Total Bituminous	12,393,079	48,153,572	3.88	12,769,814	49,012,706	3.84
Total Sub-Bituminous	489,736	1,458,116	2.98	545,874	1,636,031	2.99
Total Lignite	3,595,316	10,263,406	2.85	3,406,438	9,610,166	2.82
Grand total	16,478,131	59,875,094	3.63	16,722,126	60,258,903	3.60

Data for 1927 subject to revision.

OPERATING IDEAS *from* Production, Electrical *and* Mechanical Men

Graphic Measurement of Power Consumption Can Effect Many Savings

AS A RESULT of the rapid increase in the application of electricity to coal mining, and the growing complexity of electric power rates, it has become increasingly important that the operator at all times keep a careful check on the consumption and distribution of the power used at his mine.

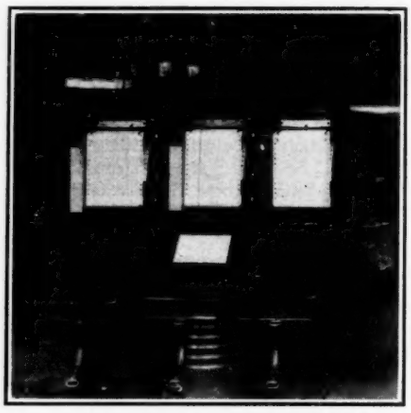
Primarily, the producer is interested in the total cost to him of a ton of coal delivered at the surface. Naturally, any comprehensive consideration of this question must include a study of the power problem in its relation to all other factors that influence the total cost. In the production of coal from shaft mines, four major power operations are necessary: Coal cutting; haulage; hoisting, and ventilation.

The larger part of mining costs at any mine is for underground work. This also applies to that portion of the electrical system used for cutting and haulage. Operating conditions underground are most unfavorable, and rugged equipment and constant supervision is required for the elimination and detection of electrical troubles. Bad track, falls of roof and extension of power lines due to development make the problem a serious one.

Cutting machines are subject to particularly severe service and often work in slate, sulphur and other foreign substances. This causes heavy power demands and, unless ample power is maintained at all times, armature trouble and loss of tonnage is bound to result. The power supply and condition of equipment likewise materially affect the tonnage that can be handled by an electric locomotive in a given time.

A survey of 21 mines, recently made by the Indiana Coal Operators Power Association, disclosed the fact, says Clifford L. Harrod, electrical engineer of the association, that mines generating all or part of their power had no idea of their power consumption and costs. Others were negotiating new power contracts, involving both demand charges and power factor penalties, with no knowledge whatever of either their maximum demand or power factor. It was this situation that led to the formation of the association for, as the power problem is similar in all mines, it was believed that it could be solved by co-operative effort.

A complete set of graphic instruments, manufactured by the Esterline-Angus Co., Indianapolis, and shown in



Watchdogs of Power Cost

an accompanying illustration, were purchased. These include a portable a.c.-d.c. wattmeter; a portable voltmeter and a portable power factor meter. These have been put to uses too numerous to mention and are in almost continual service.

Those responsible for the purchase and use of electric power should utilize graphic instruments, for not only do they enable intelligent buying of power but they also indicate many places where large savings in power, and corresponding decreases in tonnage costs, can be effected.

The cost of mining coal can be reduced by thorough surveys and tests having for their object: (1) Improving the power supply by bettering distribution; (2) eliminating unnecessary power loses; (3) reducing maximum demand and raising the power factor; (4) reduction in time lost and repair costs due to breakdowns and failure of power supply; and (5) eliminating inefficient equipment.

This requires complete tests of all electrically-driven equipment in each mine to determine the following: (1) The voltage at distant points on the system with all machines operating, to measure the maximum drop under working conditions; (2) the load characteristics of the various motor-driven machines; (3) the power factor of the system; and (4) lost power due to grounds, etc.

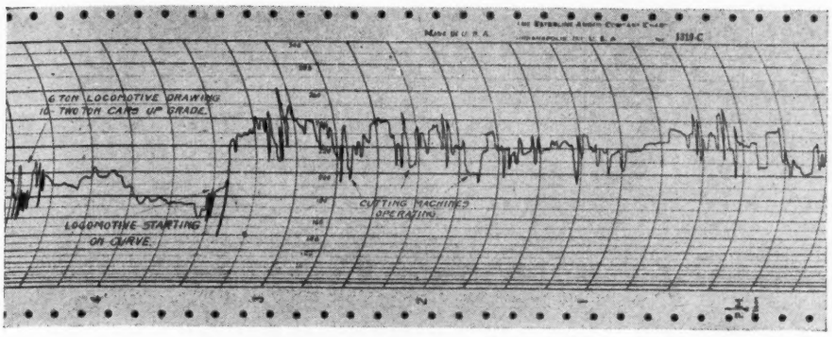
The accompanying chart serves to

PROGRESS is made step by step through the exchange of ideas. Every man learns from others. Production men, electrical men and mechanical men are constantly trying out new methods for increasing efficiency and reducing costs. One idea suggests another.

COAL AGE has been for years the medium through which operating men have traded ideas. Underground methods, shop kinks, haulage devices, tipple arrangements, electrical and mechanical pointers and safety methods all have a place in this picture.

IDEAS are worth money. *Coal Age* will pay from $5 up for those that are accepted and published in these columns. Here's your opportunity to win recognition for yourself and get paid for it. Can you use a few extra dollars? Practically everybody can.

LET'S GO! Short stories are best. We'll help you edit them. Simple sketches will do, too, or good snapshots. Our drafting room and illustration department will do the rest. Some of the most simple devices are the very things another fellow is looking for.



Records Like This Indicate Faulty Operation

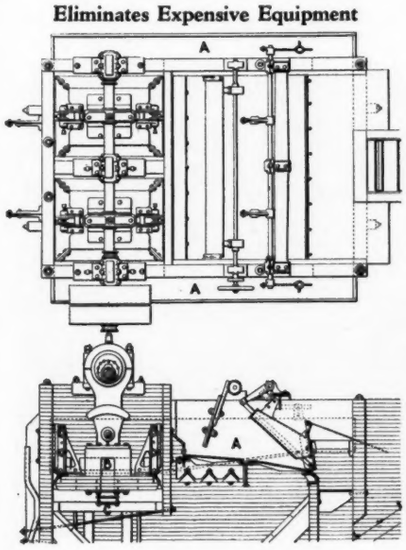
illustrate the first point mentioned in the preceding paragraph. This was taken at a point nearly a mile from the main shaft with cutting machines and haulage motors operating from the same circuit. Although the potential at the substation was 275 volts, at this point it dropped as low as 140 volts. Obviously, this is a most uneconomical condition but, if the bottom was satisfactory and the return track circuit properly bonded, it could be corrected at little cost by the installation of cross lines and automatic circuit breakers.

Many defects in the power system, such as broken and hanging insulators, loose trolley wires that permit the trolley pole to come in contact with slate, defective lightning arrester installations, accumulations of copper dust on generating equipment, poor commutation, etc., can be found by visual inspection. However, load conditions, power factor and voltage can be accurately determined only by the use of graphic instruments.

Launders Replace Pumps On Jig Water System

At the Baker breaker of the Glen Alden Coal Co. a device introduced by John Frew, superintendent of construction and preparation, has greatly lessened pumping costs. In every jig washer the waste water must be collected and repumped into the jig. It is known as circulating water in contradistinction to the make-up water that replaces what is drained off the prepared coal at points where it cannot find its way back to the breaker. This circulating water was at Baker breaker, as in many others, collected into a piping system and pumped to the various jigs. Realizing that about a foot of lift was about all that was needed to replace the water in the jig, Mr. Frew carried the water back by launder *A* into an opening in the jig plunger near *B*. Here the water passes into the jig during the suction stroke through the valve *C*, which originally was made as a flap valve but is now of the lifting type. When the upstroke is completed the descent of the plunger closes this valve and forces the water which has thus entered to take part in the jigging operation. This device has made unnecessary the operation of a big pumproom equipped with two 14,000-gal. per min. pumps, one of which was kept as a spare.

Eliminates Expensive Equipment



Halved Production May Double Power Cost

Because conditions may allow little or no reduction in the power required for ventilation and pumping, and also because in some cases there is a minimum demand charge, the power cost per ton of production usually increases materially when the production drops below normal. This is indicated by the accompanying table showing power costs in cents per ton.

The mines represented in this table were selected at random from the southern bituminous fields and represent a wide range of conditions. The first five mines are on purchased power. Mines No. 6 and 7, which show more than 100 per cent increase in power cost per ton, have individual power plants. Repairs to these plants during the months of reduced output are responsible for the exceptionally-large increases.

POWER COSTS IN CENTS PER TON

Mine No.	Av. for Month of Maximum Output	Av. for Month of About 50 Per Cent Maximum Output	Per Cent Increase
1	11.4	18.9	66
2	8.3	16.0	93
3	6.7	11.0	64
4	6.0	11.0	83
5	4.2	8.1	93
6	7.3	19.0	160
7	5.8	12.3	112

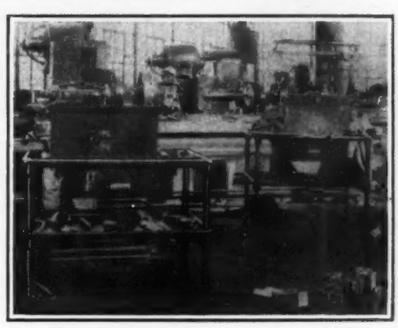
Portable Racks Increase Efficiency of Shop

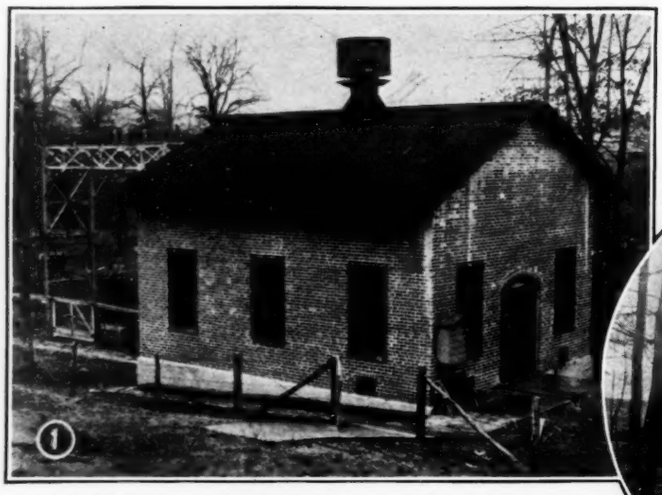
Machinists, to do their work properly, must necessarily have a fairly large number of hand tools. In addition to these, there are a number of jigs, fixtures and other accessories belonging to each machine tool in every fair-sized shop. In order that these always may be available to the operator, this company has provided each of its larger machine tools with one of the portable tool racks shown in the accompanying photograph.

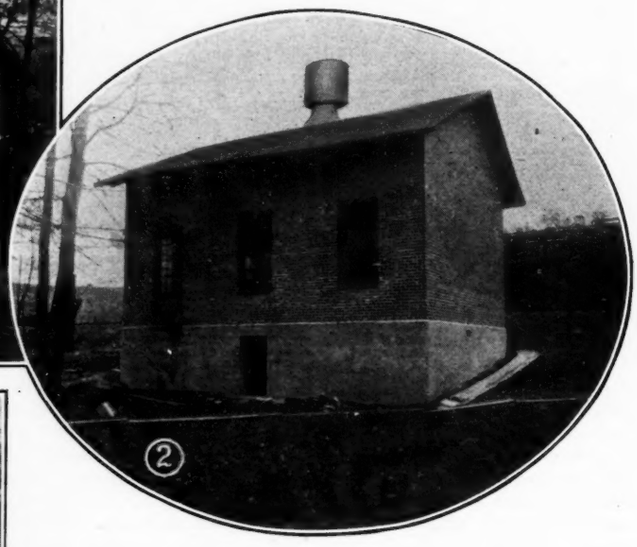
These were not built in the shop but were purchased from a manufacturer. It is the general policy of this company to buy such equipment and devices, when they can be obtained, rather than attempt to build them in its own shop. These racks or benches not only furnish a convenient place for the individual machinist's tool box but they also contain a drawer where either tools or highly finished jigs or fixtures may be stored. There are, also, at least two shelves for the storage of various machine accessories.

Equipment of this kind insures that the various jigs, fixtures and accessories to be used on any particular machine will always be at hand and in good condition. As each rack is fitted with casters, it can readily be moved from place to place. These racks cost comparatively little, yet add appreciably to the efficiency of each shop man.

Keeps Tools Where Needed



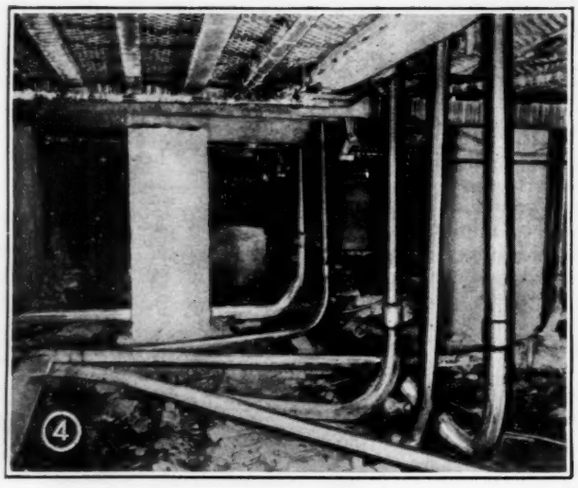


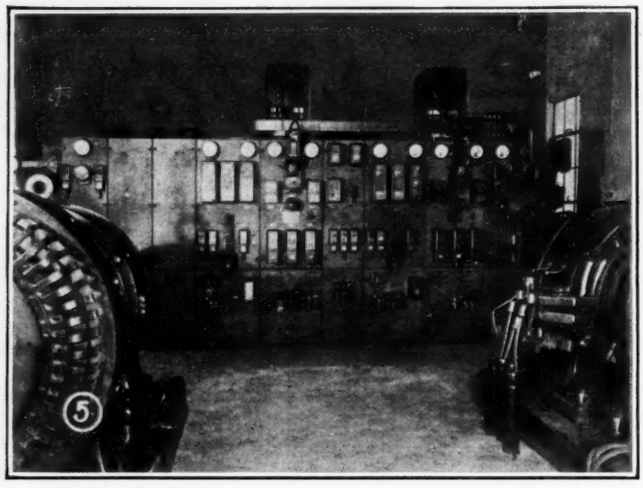


Install Substation Nearer Face As Workings Are Extended

AS THE workings of a large mine are extended farther and farther from the shaft or portal, there comes a time when it is advisable to install conversion equipment nearer the face. At the Whipple mine of the New River Co., near Oak Hill, W. Va., the synchronous motor generators were moved from the original substation, but the manual control was discarded and full automatic control purchased.

A front view of the new building is shown at (*1*). It is located a little over a mile from the shaft. The back of the substation, and the entrance to the space beneath the floor, is shown at (*2*). The borehole for the d.c. feeders is seen at (*3*). Four 500,000-circ. mil non-armored cables, insulated for 2,000 volts with varnished cambric and braid, are installed in the 6-in. cased hole, which is 470 ft. deep. The conduits under the floor are seen at (*4*). The fifth photograph shows two 275-volt 900-r.p.m. synchronous motor-generator sets having capacities of 150 kw.





Transit Refinements and Long Tapes Eliminate Costly Errors in Surveys

A 300-FT. TAPE and a properly adjusted transit contribute to an accurate survey, declared Karl F. Schoew, mining engineer, Huntington, W. Va., in an address at Marshall College in that city. When making a survey over frozen ground that is liable to thaw, if a backsight is taken it should be followed by a foresight within less than a minute. The reason why surveys often do not tie is because the uncertainties of frozen ground are not taken into consideration.

Mr. Schoew evidently assumes in his remarks that a man is employed on the staff whose sole duty it is to give backsights. In a straight-away survey where no brush has to be cut, a backsight man should be provided as he is a real economy. However, where none is employed, and especially where the cutting of brush delays progress and therefore lengthens the time between backsighting and foresighting, some engineers plant the transit on firmly driven stakes. Thus, the necessity of setting the ends of the legs on frozen ground, roots or boggy material is avoided.

In changing position from a point from which a backsight can be taken to a position whence a foresight can be made, the instrument will nearly always go out of plumb, and the plummet will leave the tack. Consequently, some engineers regard a firm base as even more requisite than speed in taking sights. When chainmen measure from the tack under the instrument, they almost invariably cause loose or boggy ground (whether frosted or not) to move. Moreover, they may tread on roots or buried brush-pile material on which a leg point may be resting.

If a backsightman and a foresightman are both available, this latter difficulty can be avoided. Under these conditions, the sole trouble arises from the circling of the instrument by the transitman himself and the delay between the sights, which usually is of somewhat less importance.

The use of a 300-ft. tape is advocated by Mr. Schoew because of the errors that arise from broken measurements. On an important survey (three miles in length) to connect the Coaldale and Mill Creek mines at Coaldale, W. Va., he says, a light 500-ft. tape was used. The survey ran from the face of the main entry in the Coaldale mine to the outside; thence to and through the "East End" railroad tunnel, 3,300 ft. in length; thence along the outside and into Mill Creek mine to a working face.

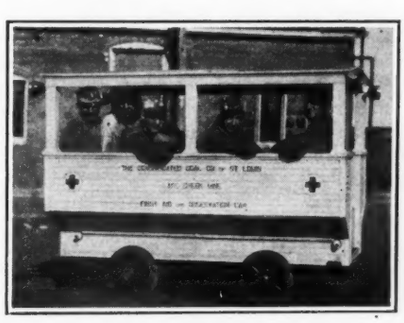
The first night—for the work was done after dark—with the help of two experienced chainmen, new stations were lined in along the route to the face of the working place in the Mill Creek mine. The stations were set apart as far as tallow candle lights could be seen, these latter being used to avoid making smoke. One of the stations was 2,200 ft. distant from its nearest neighbor. Careful measurements were taken.

The next night the transit was used and a compass reading was taken in the end of an abandoned working which was free of iron. The angle was read between this line and the first line in the Mill Creek mine end of the survey. A similar observation was made at the Coaldale end, thus affording a needle check on the whole work.

By taking the measurements one night and transit readings the next, Mr. Schoew's mind was kept free to direct itself wholly on one operation at a time. The work being done at night also could be performed with minimum interruptions. With a long tape, all broken measurements are totalled automatically and errors are avoided. With a short one frequent readings and records must be made. Thus errors may occur. As a result of the precautions taken, the two roads were joined accurately.

Novel First Aid Car Has Spring Suspension

A combination inspection and first aid car recently was put into service by the Consolidated Coal Company of St. Louis at its Lake Creek mine, Johnson City, Ill. Eventually, the company plans to have a similar car, ready for service at all times, at each of its mines, says Robert Bowie, district superintendent.



Ready for an Inspection Trip

The car is built on an ordinary mine-car chassis and is fitted with standard-size wheels. It is supported on four Ford automobile springs which give it easy riding qualities not found in the common mine car. The seats are wide and roomy, and four small-sized automobile headlights serve to illuminate the workings through which the car is hauled. But two lights are used at one time, lighting up the roadway behind the car as it is drawn by a locomotive. The current for these lamps can be furnished directly from the battery locomotive (if one is used) or from a storage battery carried in the car.

The general purpose of the car is to enable the executives of the company to make a thorough and rapid inspection of the underground workings. This is accomplished without the usual fatigue which accompanies a trip on foot through a large mine.

When used as a first aid car in transporting the injured, a stretcher is employed. This is supported by two boards placed across the car from one seat to the other. The stretcher, in conjunction with the spring suspension of the car, makes a more comfortable mode of transportation than a motor or pit car. This method of removing the injured from the mine is also much more rapid and less painful that when the stretcher is manually carried.

False Flanges Trimmed With Gas Torch

Turning, grinding and wearing with abrasive brake shoes, are the common methods of preventing and reducing false flanges on steel tires. Another method, seldom used, is to cut off the flange with a gas torch.

An arrangement which makes this practical is shown in the accompanying photograph taken at the Nellis (W. Va.) mine of the American Rolling Mill Co. It shows T. W. Blake, chief electrician, demonstrating the torch guide which he made. The tires on this particular locomotive were trimmed on the day before the photograph was made. After trimming, abrasive brake shoes were applied. As may be seen, the trimmed portions of the tires already have been smoothed

Does a Quick and Accurate Job

while in service and only a few of the torch marks can be seen.

The torch guide consists of a short home-made jack which has a slotted arm welded to it near the end that rotates in the center of the locomotive axle. The extension to the slotted arm is a ½ x 2-in. bar which has seven torch-tip holes. These several holes, and the slot adjustment, adapt the guide to all tire sizes used at the mine—from 22 to 28 in. in diameter.

Because the holes in the extension arm fit the torch-tip exactly, and the arm is bent so as to hold the tip at an angle with the center line of the axle, the tread is cut to approximately the correct contour. As the torch is guided accurately the cut is wonderfully smooth. Nevertheless, it is the practice to use abrasive brake shoes for a few days to smooth the surface.

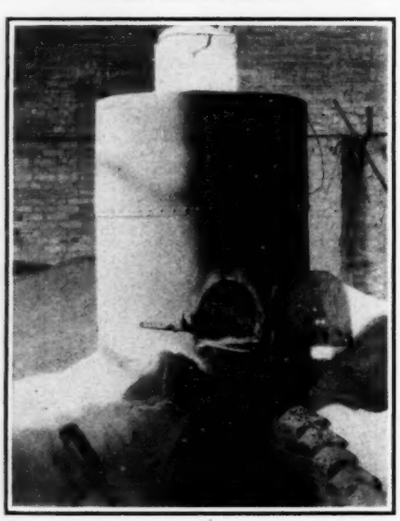
Home-Made Sand Drier Fills the Bill

Drying sand is an operation that must be performed at practically every electrified mine. Many special devices for this purpose are already on the market but occasionally one is found of local manufacture that answers every purpose. The sand-dryer employed at the Delmont mine was, for the most part, built from odds and ends. Yet, it is so well designed that even when operated at a normal rate it keeps five main-line locomotives supplied with sand. It is cared for, during off moments, by the substation attendant throughout the day and by the watchman at night.

The capacity of this machine is approximately 10 tons in 24 hours. The body or outer shell is a section of discarded steel smokestack, 4½ ft. in diameter and 5 ft. long. The grate bars, made of 20-lb. rail, rest upon a brick setting about 12 in. above the floor. The furnace and its stack are built of ordinary fire brick, the furnace walls being so inclined as to meet the outer shell at the grate level.

When dry, the sand flows through holes cut in the outer shell at a level about 6 in. above the grate. This shell is not anchored in place and can, therefore, be lifted to give access to the grate when cleaning or replacement of the bars becomes necessary.

Delivers the Goods



Emergency Stop Provided For Hoist Cager

To obtain speedy hoisting, fractions of a second must not be wasted. If the cager at the shaft bottom waits until he sees that the loaded car is properly dogged before he gives the signal, hoisting will not start until at least one-quarter of a second later.

To save this time, the hoisting signal must be given by the cager before he sees that the car is dogged. This, in turn, requires that the cager have some means of stopping the hoist in the quickest possible time.

At Peabody No. 9, Taylorville, Ill., the control circuit of the 1,050-hp. electric hoist is taken to the bottom of the shaft and a switch there installed. From the switch a rope is extended above the cager's head. By pulling this rope he opens the switch which, in turn, cuts the power off the motor and sets the brake. This gives the cager a chance to avert a wreck in event that the loaded car does not dog properly.

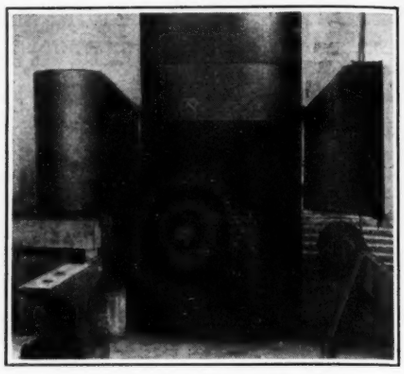
A test made at the time that the emergency stop was installed demonstrated that the cager, if he pulls the rope as soon as he notices the cage start, can stop it before it moves over 40 in. When using the pneumatic for signaling a stop under similar conditions, the cage would travel 8 to 10 ft. before coming to rest.

Confining Doors Make Forge Smokeless

In mine blacksmith shops it is not unusual to see forges made from shells or drums of discarded boilers. It is unusual, however, to see the cut-away parts of the shell utilized as doors to enclose the fire. Such an arrangement is used in the Earlington (Ky.) shop of the West Kentucky Coal Co.

Here the forge is installed in the same room with a complete outfit of mcahine tools—naturally, smoke, soot and cinders are taboo. Although the walls and ceiling are painted white they show, even adjacent to the forge, but slight discoloration.

When the forge is fired, care is taken to keep the doors closed (so far as possible) during the time that much smoke is given off. This type of forge, and method of handling, solves the problem of the forge as a necessary adjunct in a machine shop.



No Smoke, Soot or Cinders Here

Underground Telephones Have Switchboard

Present day efficiency and larger mines call for a means of communication which is faster, more flexible and surer of understanding than to "send word by the motorman." The installation of telephones is, of course, the answer but long distances, progressive working locations and difficulties of line maintenance have limited the application inside of mines.

Good telephone service at a large plant demands a switchboard. However, at very few mines are the inside telephones connected to the switchboard if there is one. Difficulty in keeping the inside lines free of grounds, short, and inductive interference, is the principal reason.

A good manner in which to handle the mine phones is that used in the No. 9 mine of the Peabody Coal Co., Taylorville, Ill.—a 7,000-ton operation. In this mine are thirteen telephones and there is a separate line to each section. The lines converge to a small plug-board located in the underground shop near the bottom of the shaft. From here a single telephone line goes to the system above ground.

With this arrangement, a mine line which is out of commission can be disconnected from the rest of the system. Or the line to any section of the mine can be connected individually to the line leading to the surface, thus assuring privacy in conversation from the office above ground to that section. At practically all times there is someone in the shop who can be called to change connections on the board.

The type of conductor used on inside telephone lines has an important bearing on continuity of service. In the No. 9 mine the conductors are No. 12 rubber-covered single-braid iron wire.